

# **G7L332-L**

## **System Board User's Manual**

935-G7L321-000G  
A09400904

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## Trademarks

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## FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

### Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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## About this Manual

An electronic file of this manual is included in the CD. To view the user's manual in the CD, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

## Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

## Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



### **Important:**

*Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.*

## Safety Measures

To avoid damage the system:

- Use the correct AC input voltage range.

To reduce the risk of electric shock:

- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

## About the Package

The system board package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- ☑ One system board
- ☑ One IDE cable
- ☑ One FDD cable
- ☑ One bracket mounted with 2 USB ports
- ☑ One Serial ATA data cable
- ☑ One Serial ATA power cable
- ☑ One I/O shield
- ☑ One "Mainboard Utility" CD
- ☑ One user's manual
- ☑ One QR (Quick Reference)

The system board and accessories in the package may not come similar to the information listed above. This may differ in accordance to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

## Before Using the System Board

Before using the system board, prepare basic system components.

If you are installing the system board in a new system, you will need at least the following internal components.

- A CPU
- Memory module
- Storage devices such as hard disk drive, CD-ROM, etc.

You will also need external system peripherals you intend to use which will normally include at least a keyboard, a mouse and a video display monitor.

# Chapter I - Introduction

## Specifications

Processor	<ul style="list-style-type: none"><li>• LGA 775 socket for:<ul style="list-style-type: none"><li>- Intel® Core™2 Duo</li><li>- Intel® Pentium® Dual-Core E2000 series</li><li>- Intel® Pentium® 4</li><li>- Intel® Celeron® 400 series</li><li>- Intel® Celeron® D</li></ul></li><li>• Supports FMB 05A/06 up to 95W CPU</li><li>• Supports Intel Enhanced Memory 64 Technology (EMT64T)</li><li>• Supports Enhanced Intel SpeedStep Technology (EIST)</li><li>• Supports Intel Hyper-Threading Technology</li><li>• Supports 800/533MHz FSB</li></ul>
Chipset	<ul style="list-style-type: none"><li>• Intel® chipset<ul style="list-style-type: none"><li>- Northbridge: Intel® 945GC Express chipset</li><li>- Southbridge: Intel® ICH7</li></ul></li></ul>
System Memory	<ul style="list-style-type: none"><li>• Two 240-pin DDR2 DIMM sockets support up to 2GB system memory</li><li>• Supports DDR2 533 and DDR2 667 DIMMs</li><li>• Supports dual channel (128-bit wide) memory interface</li><li>• Supports non-ECC x8 and x16 DIMMs</li><li>• Supports 4 banks for all DDR2 devices up to 512Mbit density</li><li>• Supports 8 banks for 1Gbit DDR2 devices</li><li>• Supports unbuffered DIMMs</li></ul>
Expansion Slots	<ul style="list-style-type: none"><li>• 1 PCI Express x16 slot</li><li>• 2 PCI Express x1 slot</li><li>• 1 PCI slots</li></ul>
Graphics	<ul style="list-style-type: none"><li>• Built-in Intel Graphics Media Accelerator 950</li></ul>
Audio	<ul style="list-style-type: none"><li>• 6-channel audio CODEC</li><li>• Full-duplex codec with independent variable sampling rate</li><li>• True stereo line level outputs</li><li>• S/PDIF-in/out interface</li></ul>
LAN	<ul style="list-style-type: none"><li>• RTL8110SC Gigabit ethernet controller</li><li>• Supports 10Mbps, 100Mbps and 1Gbps data transmission</li><li>• IEEE 802.3 (10/100Mbps) and IEEE 802.3ab (1Gbps) compliant</li></ul>
Serial ATA	<ul style="list-style-type: none"><li>• Supports four SATA (Serial ATA) interfaces which are compliant with SATA 1.0 specification</li><li>• SATA speed up to 3Gb/s</li></ul>
IDE	<ul style="list-style-type: none"><li>• Supports up to UltraDMA 100Mbps hard drives</li><li>• PIO Mode 4 Enhanced IDE (data transfer rate up to 14MB/sec.)</li></ul>



Rear I/O	<ul style="list-style-type: none"> <li>• 1 mini-DIN-6 PS/2 mouse port</li> <li>• 1 mini-DIN-6 PS/2 keyboard port</li> <li>• 1 DB-25 parallel port</li> <li>• 1 DB-9 serial port and 1 DB-15 VGA port</li> <li>• 1 RJ45 LAN port</li> <li>• 4 USB 2.0/1.1 ports</li> <li>• Mic-in, line-in and line-out jacks</li> </ul>
I/O Connectors	<ul style="list-style-type: none"> <li>• 2 connectors for 4 additional external USB 2.0/1.1 ports</li> <li>• 1 connector for 1 external COM port</li> <li>• 1 front audio connector for line-out and mic-in jacks</li> <li>• 1 CD-in internal audio connector</li> <li>• 1 S/PDIF-in/out connector</li> <li>• 1 connector for IrDA interface</li> <li>• 4 Serial ATA connectors</li> <li>• 1 40-pin IDE connector and 1 floppy connector</li> <li>• 1 24-pin ATX power connector</li> <li>• 1 4-pin 12V power connector</li> <li>• 1 front panel connector</li> <li>• 2 fan connectors</li> </ul>
BIOS	<ul style="list-style-type: none"> <li>• Award BIOS</li> <li>• 4Mbit flash memory</li> </ul>
Energy Efficient Design	<ul style="list-style-type: none"> <li>• Supports ACPI specification and OS Directed Power Management</li> <li>• Supports ACPI STR (Suspend to RAM) function</li> <li>• Wake-On-Events include: <ul style="list-style-type: none"> <li>- Wake-On-PS/2/USB Keyboard/Mouse</li> <li>- Wake-On-LAN and Wake-On-Ring</li> <li>- RTC timer to power-on the system</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• System power management supported</li> <li>• CPU stopped clock control</li> <li>• Microsoft®/Intel® APM 1.2 compliant</li> <li>• Soft Power supported - ACPI v1.0a specification</li> <li>• AC power failure recovery</li> </ul>
Damage Free Intelligence	<ul style="list-style-type: none"> <li>• Monitors CPU/system temperature and overheat alarm</li> <li>• Monitors Vcore/V3SB/Vcc3/Vcc5/12V/V5SB/VBAT voltages and failure alarm</li> <li>• Monitors CPU/chassis fan speed and failure alarm</li> <li>• Read back capability that displays temperature, voltage and fan speed</li> <li>• Watchdog Timer function</li> </ul>
Temperature	<ul style="list-style-type: none"> <li>• 0°C to 60°C</li> </ul>
Humidity	<ul style="list-style-type: none"> <li>• 10% to 90%</li> </ul>
PCB	<ul style="list-style-type: none"> <li>• 4 layers, microATX form factor</li> <li>• 24.4cm (9.6") × 24.4cm (9.6")</li> </ul>

## Features

### WATCHDOG TIMER

The Watchdog Timer function allows your application to regularly “clear” the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

### HYPER-THREADING TECHNOLOGY

The system board supports Intel processors with Hyper-Threading Technology. Enabling the functionality of Hyper-Threading Technology for your computer system requires **ALL** of the following platforms.

#### Components:

- CPU - an Intel® Pentium® 4 Processor with HT Technology
- Chipset - an Intel® chipset that supports HT Technology
- BIOS - a BIOS that supports HT Technology and has it enabled
- OS - an operating system that includes optimizations for HT Technology

Please refer to Appendix A for information about enabling the functionality of the Hyper-Threading Technology. For more information on Hyper-Threading Technology, go to: [www.intel.com/info/hyperthreading](http://www.intel.com/info/hyperthreading).

### PCI EXPRESS

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The system board currently supports the physical layer of x16 lane widths. The x16 PCI Express lane supports transfer rate of 4 Gigabytes per second.

### DDR2

DDR2 is a higher performance DDR technology whose data transfer rate delivers bandwidth of 4.3 GB per second and beyond. That is twice the speed of the conventional DDR without increasing its power consumption. DDR2 SDRAM modules work at 1.8V supply compared to 2.6V memory voltage for DDR modules. DDR2 also incorporates new innovations such as the On-Die Termination (ODT) as well as larger 4-bit pre-fetch against DDR which fetches 2 bits per clock cycle.

**GRAPHICS**

The graphics flexibility of the built-in Intel® Graphics Media Accelerator (GMA) 950 supports enhanced 2D, 3D and video capabilities. It also support widescreen LCD displays, accelerated DirectX\* 9 3D and PCI Express graphics cards.

**5.1-CHANNEL AUDIO**

The audio jacks at the rear panel will support 6-channel audio only when the audio utility is configured to support this function. The mic-in at the rear will be disabled. Use the front audio's mic-in jack.

**S/PDIF**

S/PDIF is a standard audio file transfer format that transfers digital audio signals to a device without having to be converted first to an analog format. This prevents the quality of the audio signal from degrading whenever it is converted to analog. S/PDIF is usually found on digital audio equipment such as a DAT machine or audio processing device. The S/PDIF connector on the system board sends surround sound and 3D audio signal outputs to amplifiers and speakers and to digital recording devices like CD recorders.

**SERIAL ATA**

Serial ATA is a storage interface that is compliant with SATA 1.0 specification. With speed of up to 3Gb/s, it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.

**GIGABIT LAN**

The Realtek RTL8110SC Gigabit LAN controller supports up to 1Gbps data transmission.

**IRDA**

The system board is equipped with an IrDA connector for wireless connectivity between your computer and peripheral devices. The IRDA (Infrared Data Association) specification supports data transfers of 115K baud at a distance of 1 meter.

**USB**

The system board supports USB 2.0 and USB 1.1 ports. USB 1.1 supports 12Mb/second bandwidth while USB 2.0 supports 480Mb/second bandwidth providing a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

**WAKE-ON-RING**

This feature allows the system that is in the Suspend mode or Soft Power Off mode to wake-up/power-on to respond to calls coming from an external modem or respond to calls from a modem PCI card that uses the PCI PME (Power Management Event) signal to remotely wake up the PC.

**Important:**

*If you are using a modem add-in card, the 5V\_standby power source of your power supply must support a minimum of  $\geq 720\text{mA}$ .*

**WAKE-ON-LAN**

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port or via a PCI LAN card that uses the PCI PME (Power Management Event) signal. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

**Important:**

*The 5V\_standby power source of your power supply must support  $\geq 720\text{mA}$ .*

**WAKE-ON-PS/2**

This function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system.

**Important:**

*The 5V\_standby power source of your power supply must support  $\geq 720\text{mA}$ .*

**WAKE-ON-USB**

This function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

**Important:**

*If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V\_standby power source of your power supply must support  $\geq 1.5\text{A}$ . For 3 or more USB ports, the 5V\_standby power source of your power supply must support  $\geq 2\text{A}$ .*

**RTC TIMER**

The RTC installed on the system board allows your system to automatically power-on on the set date and time.

**ACPI STR**

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. Currently, only Windows® 2000/XP supports the ACPI function. ACPI when enabled in the Power Management Setup will allow you to use the Suspend to RAM function.

With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting “Standby” when you shut down Windows® 2000/XP without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

**Important:**

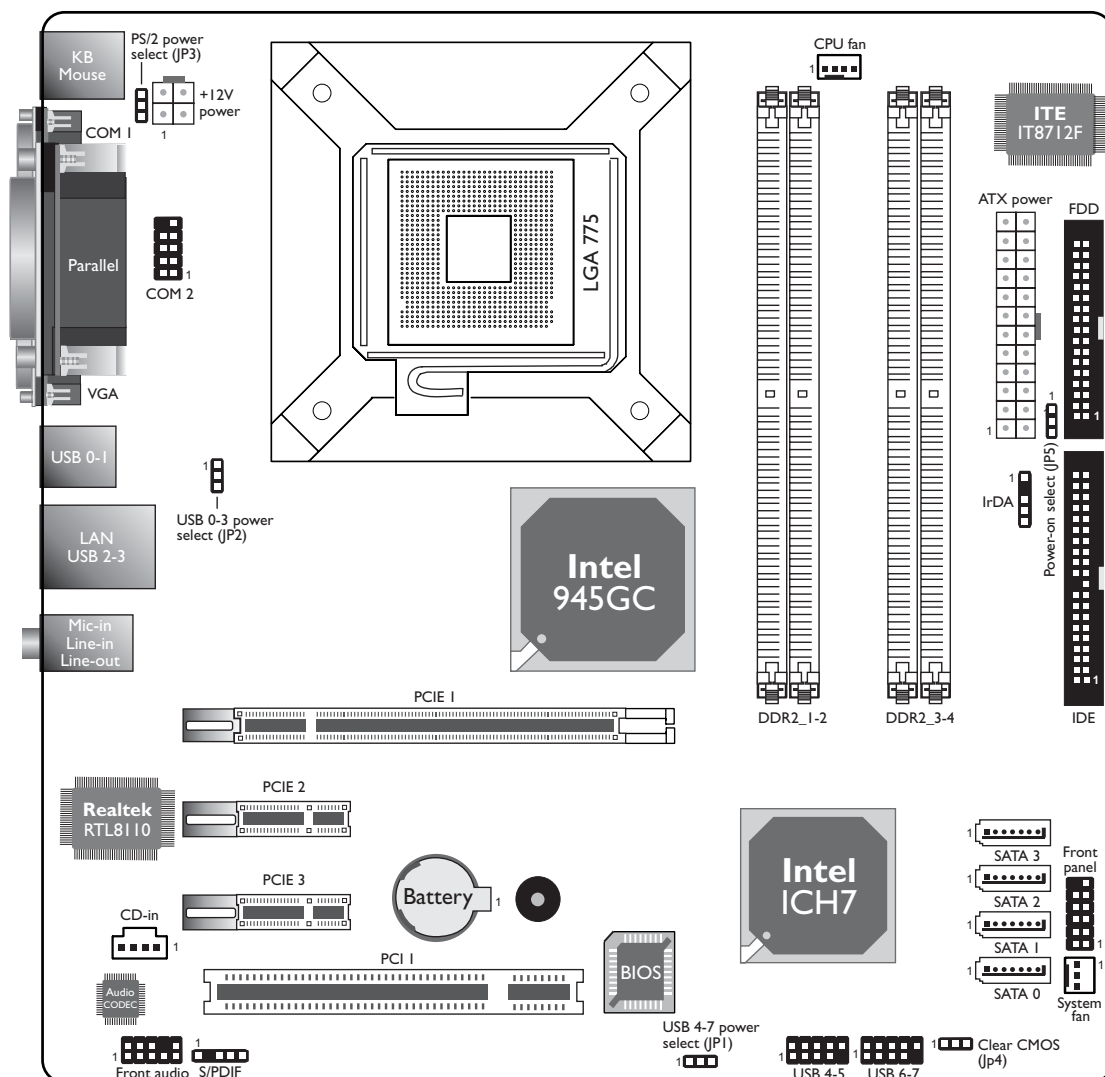
*The 5V\_standby power source of your power supply must support  $\geq 1A$ .*

**POWER FAILURE RECOVERY**

When power returns after an AC power failure, you may choose to either power-on the system manually, let the system power-on automatically or return to the state where you left off before power failure occurs.

## Chapter 2 - Hardware Installation

### System Board Layout



G7L332-L



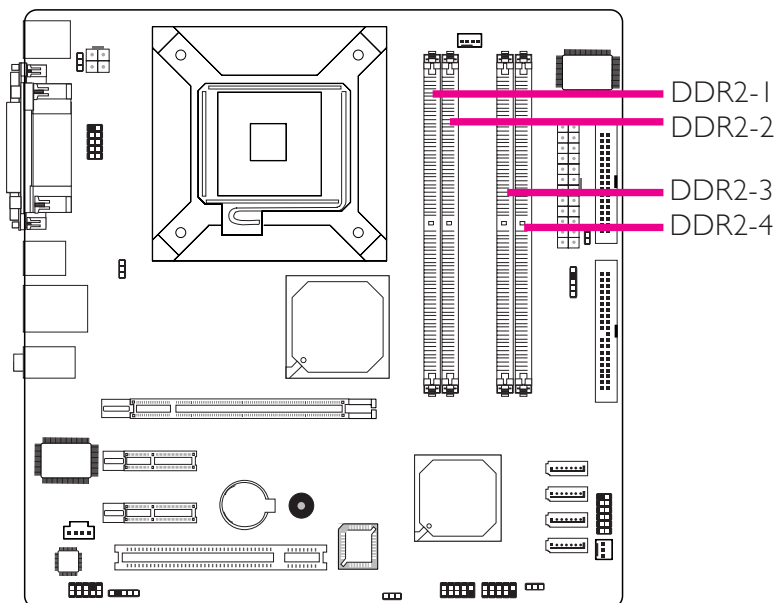
#### Note:

The illustrations on the following pages are based on the G7L332-L system board.

**Warning:**

Electrostatic discharge (ESD) can damage your system board, processor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

## System Memory



The G7L332-L system board supports two 240-pin DDR2 DIMM sockets. The sockets are divided into 2 channels:

Channel A - DDR2-1  
Channel B - DDR2-3

The system board supports the following memory interface.

### Single Channel (SC)

Data will be accessed in chunks of 64 bits (8B) from the memory channels.

### Virtual Single Channel (VSC)

If both channels are populated with different memory configurations, the MCH defaults to Virtual Single Channel.

### Dual Channel (DC)

Dual channel provides better system performance because it doubles the data transfer rate.

### Dynamic Mode Addressing

This mode minimizes the overhead of opening/closing pages in memory banks allowing for row switching to be done less often.

<b>Single Channel</b>	DIMMs are on the same channel. DIMMs in a channel can be identical or completely different. Not all slots need to be populated.
<b>Virtual Single Channel</b>	DIMMs of different memory configurations are on different channels. Odd number of slots can be populated.
<b>Dual Channel</b>	DIMMs of the same memory configuration are on different channels.
<b>Dynamic Mode Addressing</b>	In single channel, requires even number of rows (side of the DIMM) populated. This mode can be enabled with 1 SS, 2 SS or 2 DS.
	In VSC mode, both channels must have identical row structure.

### BIOS Setting

Configure the system memory in the Advanced Chipset Features submenu of the BIOS.



## Hardware Installation

The table below lists the various optimal operating modes that should be configured for the memory channel operation.

Config	DDR2_1	DDR2_2	DDR2_3	DDR2_4
No memory	E	E	E	E
Single channel A	P	E	E	E
Single channel A	P	P	E	E
Single channel A	E	P	E	E
Single channel B	E	E	P	E
Single channel B	E	E	P	P
Single channel B	E	E	E	P
Virtual single channel	E	P(**)	E	P(**)
Virtual single channel	E	P	P	E
Virtual single channel	E	P(**)	P	P(**)
Virtual single channel	P	E	E	P
Virtual single channel	P(**)	E	P(**)	E
Virtual single channel	p(**)	E	P(**)	P
Virtual single channel	P	P(**)	E	P(**)
Virtual single channel	P(**)	P	P(**)	E
Virtual single channel	P(**)	P(**)	P(**)	P(**)
Dual channel	E	P(*) (2,4)	E	P(*) (2,4)
Dual channel	P(*) (1,3)	E	P(*) (1,3)	E
Dual channel	P(*) (1,3)	P(*) (2,4)	P(*) (1,3)	P(*) (2,4)

*Continued on the next page...*

Config	DDR2_1	DDR2_2	DDR2_3	DDR2_4
Dynamic Mode Addressing	E	P(*) (2,4) DS	E	P(*) (2,4) DS
Dynamic Mode Addressing	P(*) (1,3) DS	E	P(*) (1,3) DS	E
Dynamic Mode Addressing	P(*) (1,3) DS	P(*) (2,4) DS	P(*) (1,3) DS	P(*) (2,4) DS
Dynamic Mode Addressing	E	P(*) (2,4) SS	E	P(*) (2,4) SS
Dynamic Mode Addressing	P(*) (1,3) SS	E	P(*) (1,3) SS	E
Dynamic Mode Addressing	P(*) (1,3) SS	P(*) (2,4) SS	P(*) (1,3) SS	P(*) (2,4) SS

P - denotes populated

E - denotes empty

\* - denotes DIMMs are identical

\*\* - denotes DIMMs are not identical

SS - denotes Single Sided DIMM

DS - denotes Double Sided DIMM

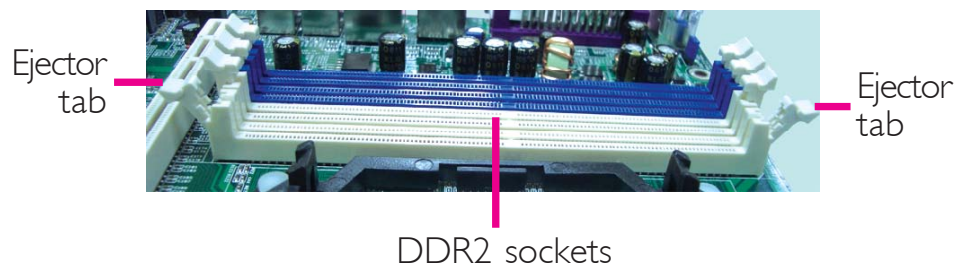
1, 2, 3 or 4 - denotes the DDR DIMM slot

## Installing the DIM Module

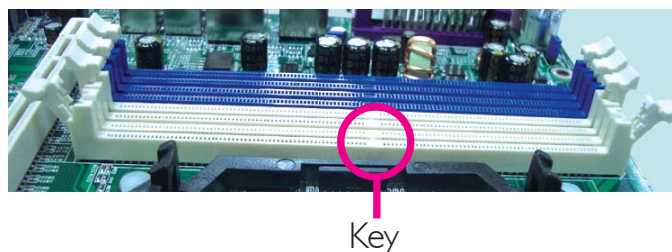
**Note:**

*The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.*

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the DDR2 socket on the system board.
4. Push the “ejector tabs” which are at the ends of the socket to the side.



5. Note how the module is keyed to the socket.



6. Grasping the module by its edges, position the module above the socket with the “notch” in the module aligned with the “key” on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.



7. Seat the module vertically, pressing it down firmly until it is completely seated in the socket.



8. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.



## CPU

### Overview

The system board is equipped with a surface mount LGA 775 socket. This socket is exclusively designed for installing a LGA 775 packaged Intel CPU.



#### **Important:**

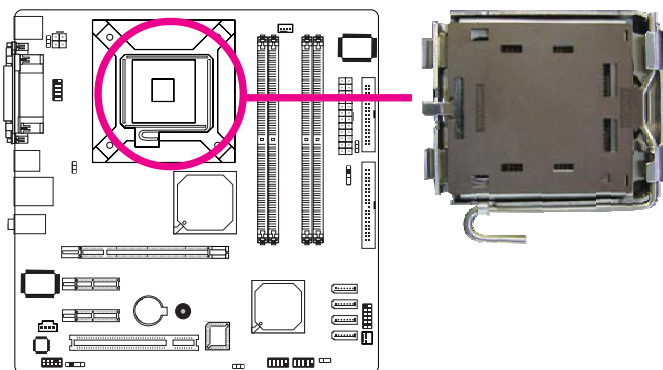
- 1. Before you proceed, make sure (1) the LGA775 socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent. If the cap is missing or the cap and/or contact pins are damaged, contact your dealer immediately.*
- 2. Make sure to keep the protective cap. RMA requests will be accepted and processed only if the LGA775 socket comes with the protective cap.*

### Installing the CPU

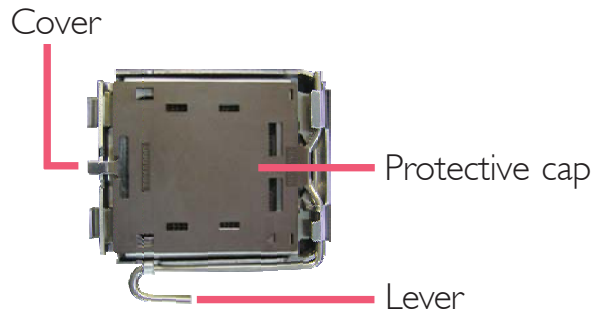
1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the LGA 775 CPU socket on the system board.

#### **Important:**

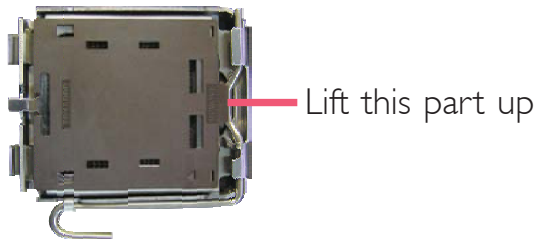
The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.



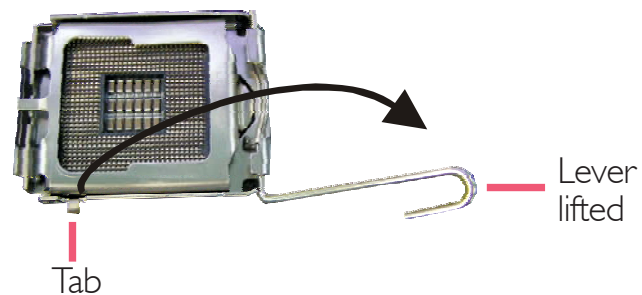
4. The CPU socket comes with a cover that is attached with a removable protective cap. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.



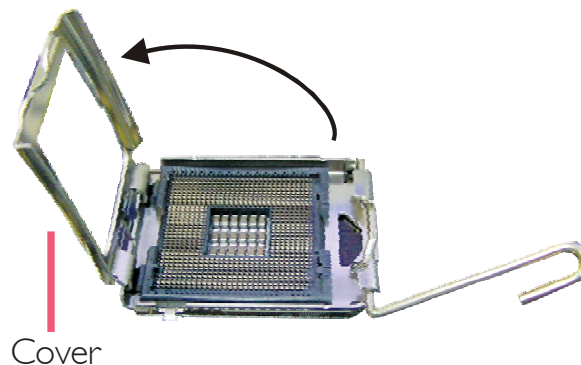
5. Lift the protective cap from the location pointed below to detach the cap from the cover.



6. Unlock the socket by pushing the lever down, moving it away from the side tab of the socket, then lifting it up.



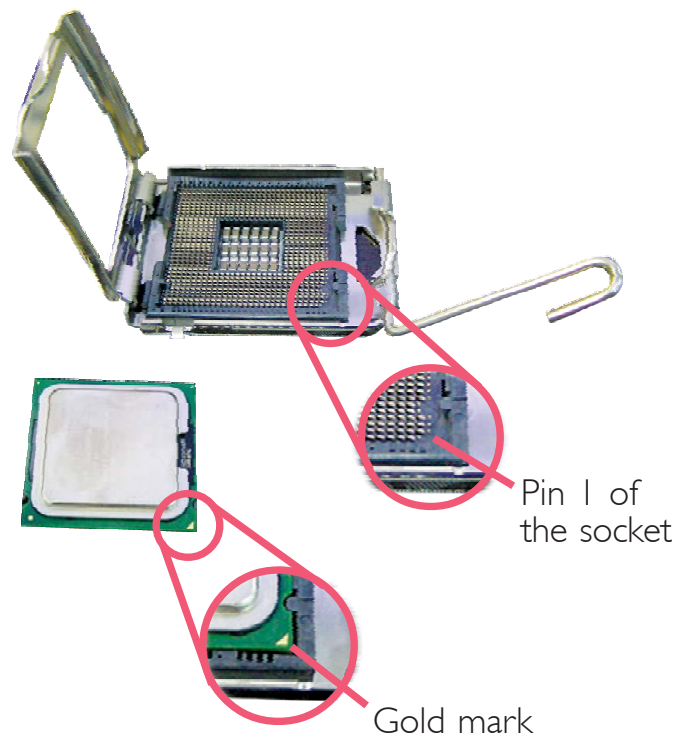
7. Now lift the cover.



8. Position the CPU above the socket. The gold mark on the CPU must align with pin 1 of the CPU socket.

**Important:**

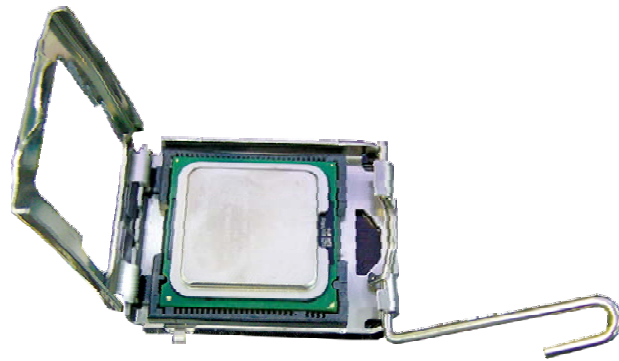
Handle the CPU by its edges and avoid touching the pins.



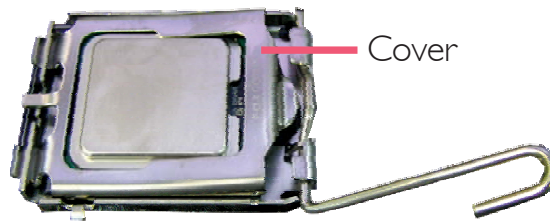
9. Insert the CPU into the socket until it is seated in place. The CPU will fit in only one orientation and can easily be inserted without exerting any force.

**Important:**

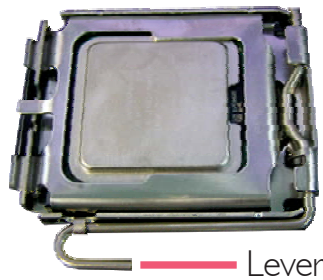
Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.



10. Once the CPU is in place, move the cover down.



11. Push the lever down to lock the socket. The lever should hook onto the side tab to indicate that the CPU is completely secured in the socket.



## Installing the Fan and Heat Sink

The CPU must be kept cool by using a CPU fan with heat sink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.



### Note:

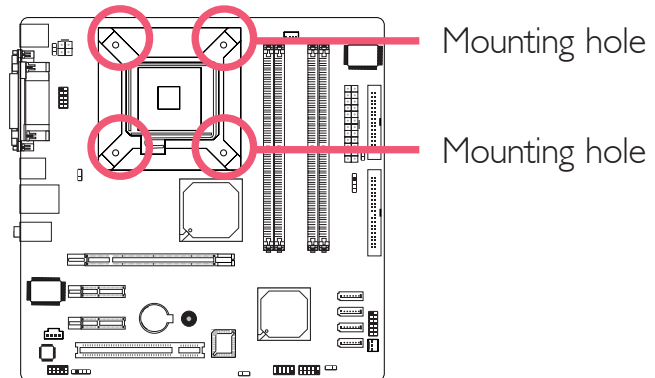
- Use only certified fan and heat sink.
- The fan and heat sink package usually contains the fan and heat sink assembly, and an installation guide. If the installation procedure in the installation guide differs from the one in this section, please follow the installation guide in the package.

1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the CPU or fan heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.

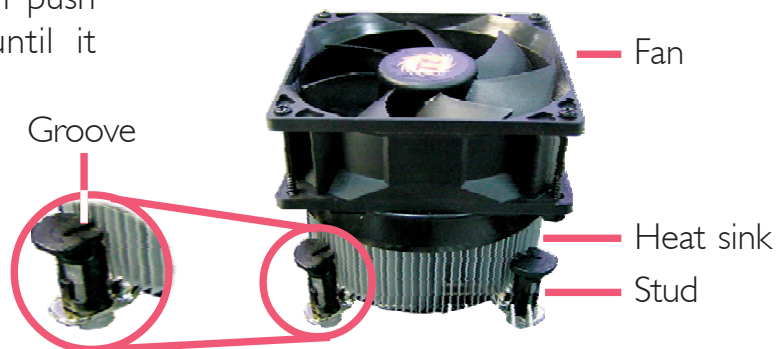
Do not apply the paste if the fan / heat sink already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the fan / heat sink on top of the CPU.



2. Place the heat sink on top of the CPU. The 4 studs around the heat sink which are used to secure the heat sink onto the system board must match the 4 mounting holes around the socket.



Position each stud so that the groove faces the heat sink then push it down firmly until it clicks into place.



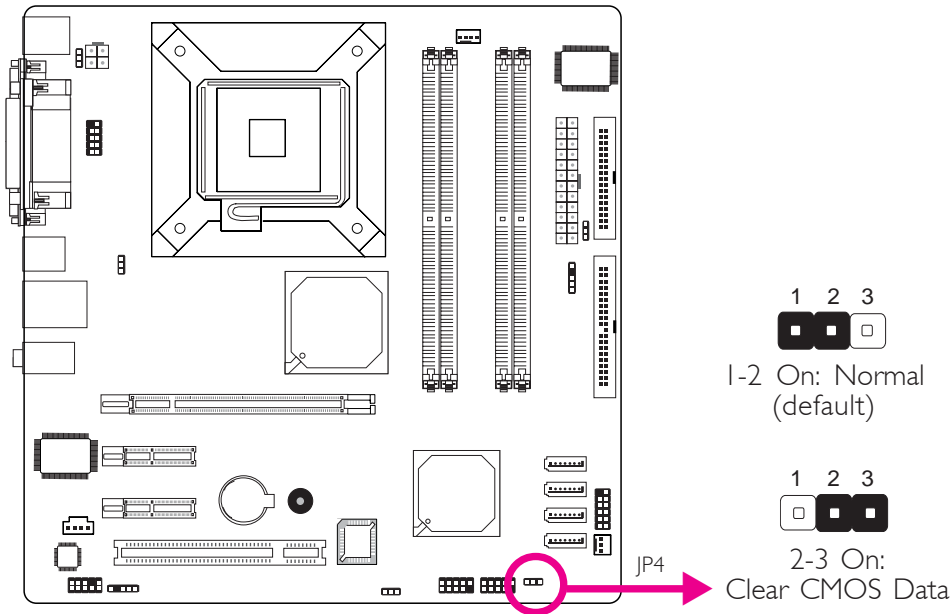
**Note:**

You will not be able to secure the fan and heat sink assembly in place if the groove is facing outward.

3. Connect the CPU fan's cable connector to the CPU fan connector on the system board.

## Jumper Settings

### Clear CMOS Data



If you encounter the following,

- CMOS data becomes corrupted.*
- You forgot the supervisor or user password.*
- You are unable to boot-up the computer system because the processor's clock ratio was incorrectly set in the BIOS.*

you can reconfigure the system with the default values stored in the ROM BIOS.

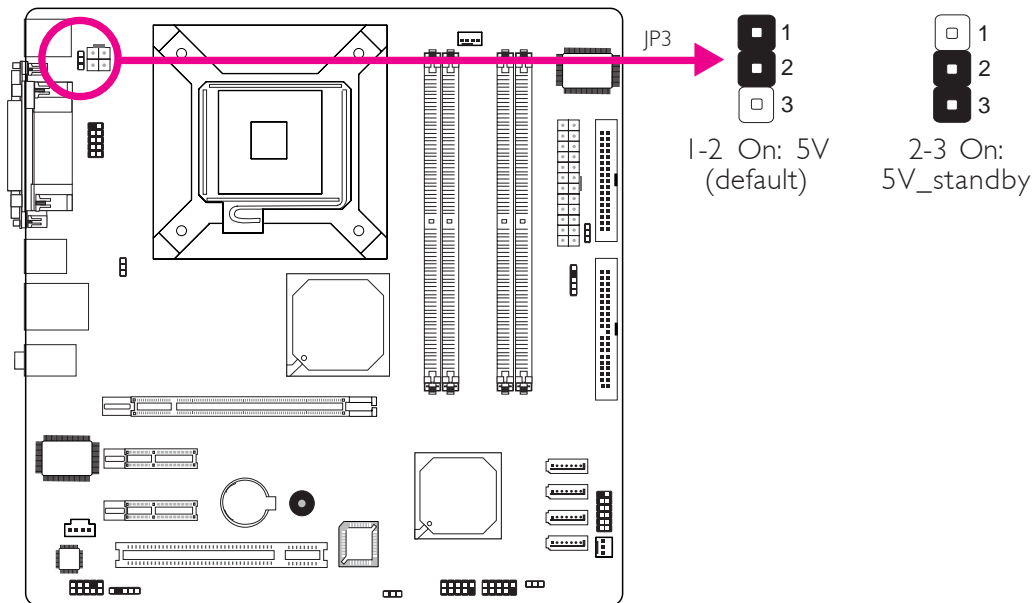
To load the default values stored in the ROM BIOS, please follow the steps below.

- Power-off the system then unplug the power cord.
- Set JP4 pins 2 and 3 to On. Wait for a few seconds and set JP4 back to its default setting, pins 1 and 2 On.
- Now power-on the system.

If your reason for clearing the CMOS data is due to incorrect setting of the processor's clock ratio in the BIOS, please proceed to step 4.

4. After powering-on the system, press <Del> to enter the main menu of the BIOS.
5. Select the Frequency/Voltage Control submenu and press <Enter>.
6. Set the processor's clock ratio to its default setting or an appropriate bus clock. Refer to the Frequency/Voltage Control section in chapter 3 for more information.
7. Press <Esc> to return to the main menu of the BIOS setup utility. Select "Save & Exit Setup" and press <Enter>.
8. Type <Y> and press <Enter>.

## PS/2 Power Select



JP3 is used to select the power of the PS/2 keyboard/mouse port. Selecting 5V\_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

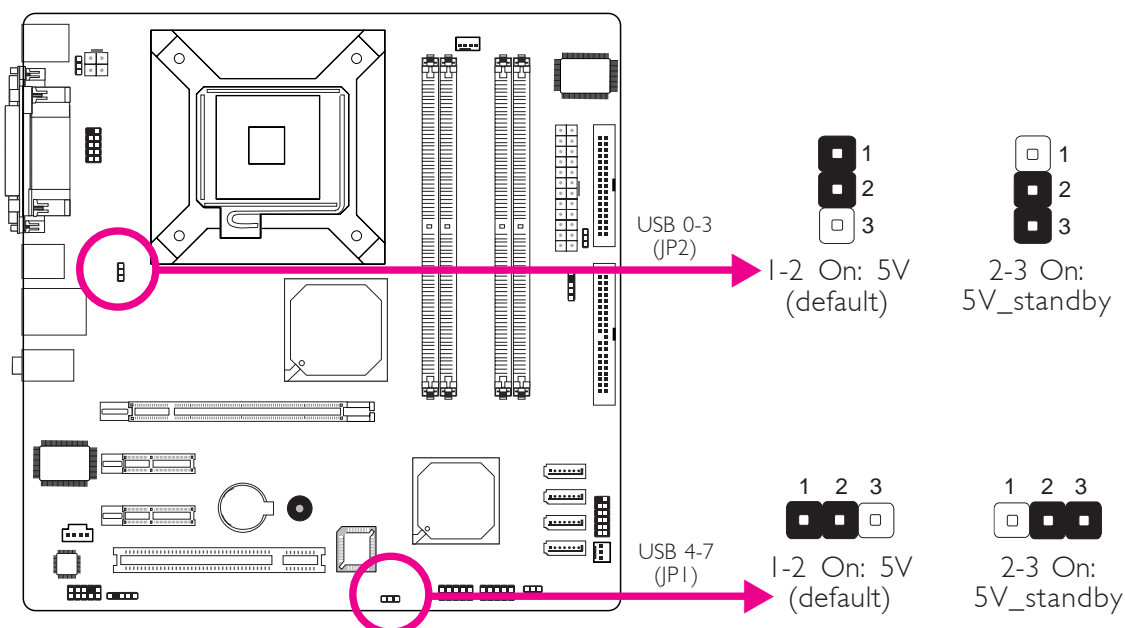
## BIOS Setting

Configure the PS/2 keyboard/mouse wake up function in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.

**Important:**

*The 5V\_standby power source of your power supply must support  $\geq 720\text{mA}$ .*

## USB Power Select



JP1 and JP2 are used to select the power of the USB ports. Selecting 5V\_standby will allow you to use the USB keyboard or USB mouse to wake up the system.

## BIOS Setting

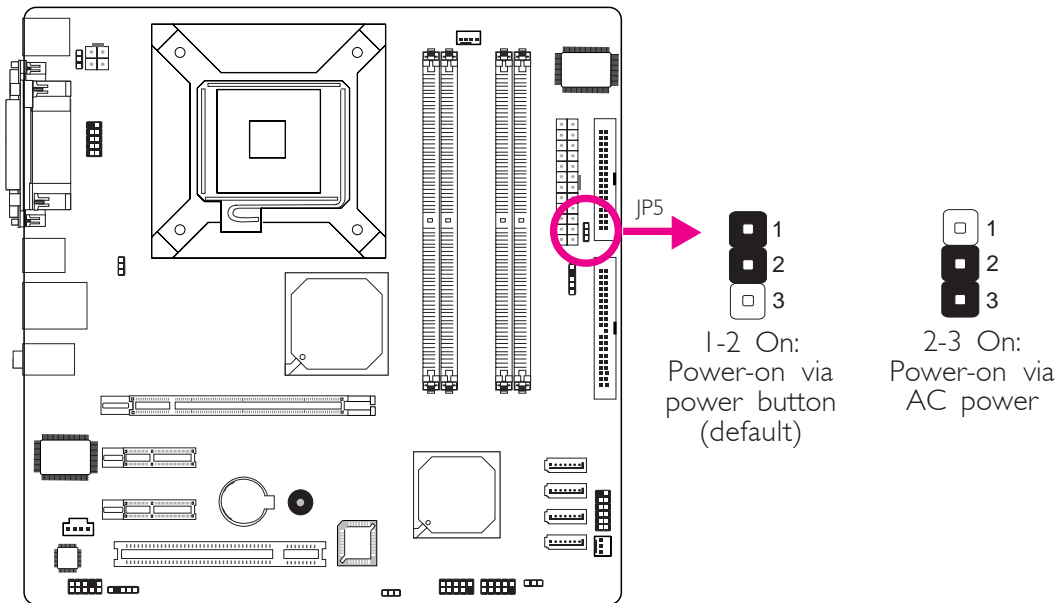
“USB KB Wake-Up From S3” in the Power Management Setup submenu of the BIOS must be set to Enabled. Refer to chapter 3 for more information.



### Important:

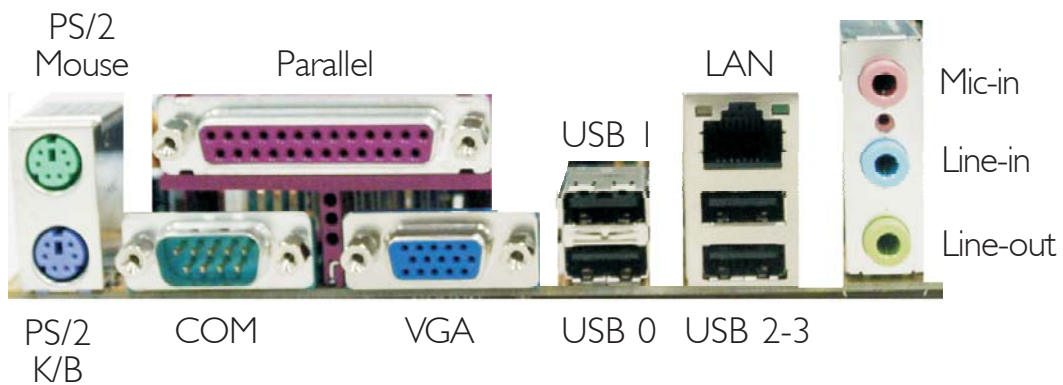
*If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V\_standby power source of your power supply must support  $\geq 1.5A$ . For 3 or more USB ports, the 5V\_standby power source of your power supply must support  $\geq 2A$ .*

## Power-on Select



JP5 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set JP5 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

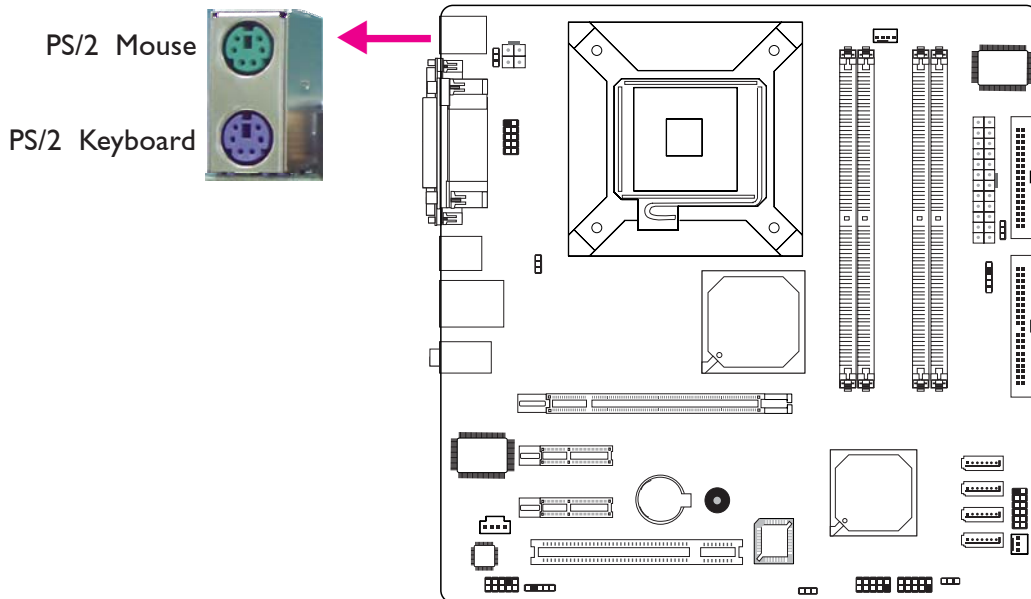
## Rear Panel I/O Ports



The rear panel I/O ports consist of the following:

- PS/2 mouse port
- PS/2 keyboard port
- Parallel port
- COM port
- VGA port
- USB ports
- LAN port
- Mic-in jack
- Line-in jack
- Line-out jack

## PS/2 Mouse and PS/2 Keyboard Ports



These ports are used to connect a PS/2 mouse and a PS/2 keyboard. The PS/2 mouse port uses IRQ12. If a mouse is not connected to this port, the system will reserve IRQ12 for other expansion cards.



### **Warning:**

*Make sure to turn off your computer prior to connecting or disconnecting a mouse or keyboard. Failure to do so may damage the system board.*

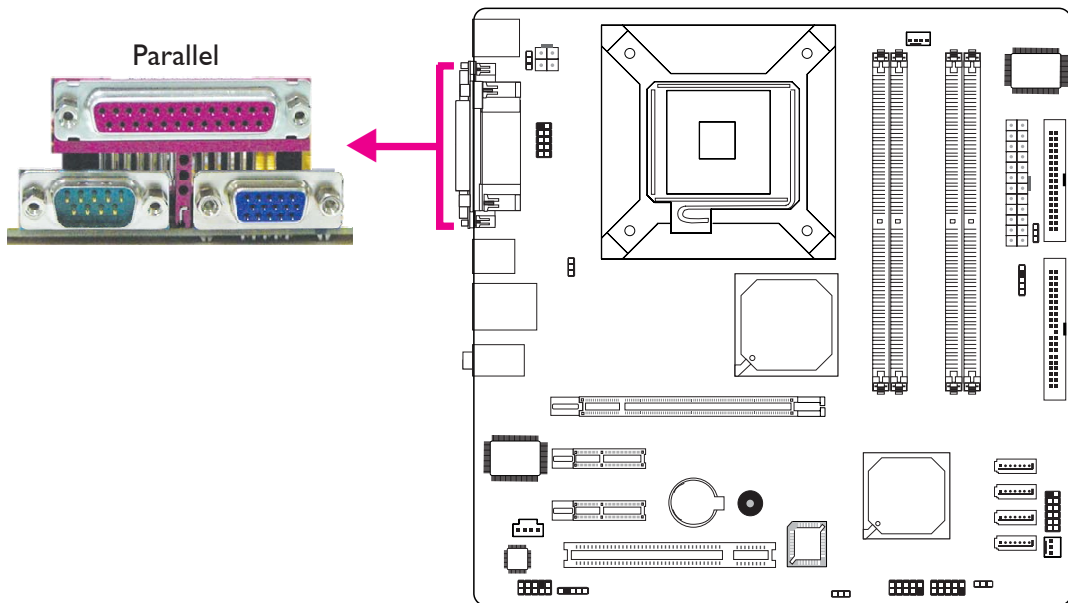
## Wake-On-PS/2 Keyboard/Mouse

The Wake-On-PS/2 Keyboard/Mouse function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system. To use this function:

- **Jumper Setting:**  
JP3 must be set to "2-3 On: 5V\_standby". Refer to "PS/2 Power Select" in this chapter for more information.
- **BIOS Setting:**  
Configure the PS/2 keyboard/mouse wake up function in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.



## Parallel Port



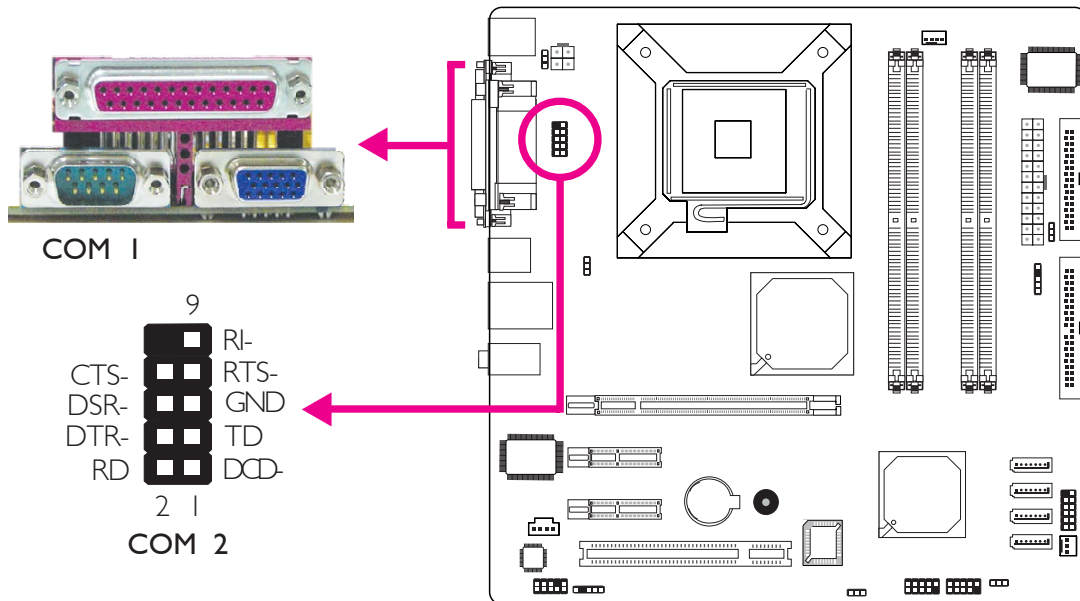
The system board has a standard parallel port for interfacing your PC to a parallel printer. It supports SPP, ECP and EPP.

Setting	Function
SPP (Standard Parallel Port)	Allows normal speed operation but in one direction only.
ECP (Extended Capabilities Port)	Allows parallel port to operate in bidirectional mode and at a speed faster than the SPP's data transfer rate.
EPP (Enhanced Parallel Port)	Allows bidirectional parallel port operation at maximum speed.

## BIOS Setting

Configure the parallel port in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.

## Serial Port



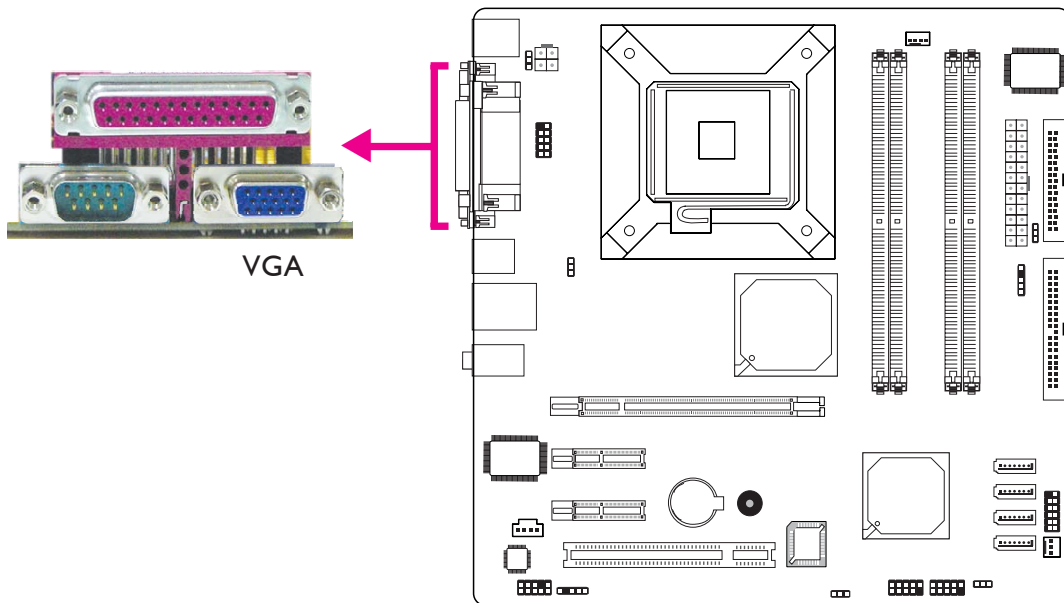
The onboard COM 1 port and the 9-pin connector for COM 2 are RS-232 asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

Your additional COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the connector that is attached to the serial port cable to this connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the connector.

## BIOS Setting

Configure the serial ports in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.

## VGA Port



The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

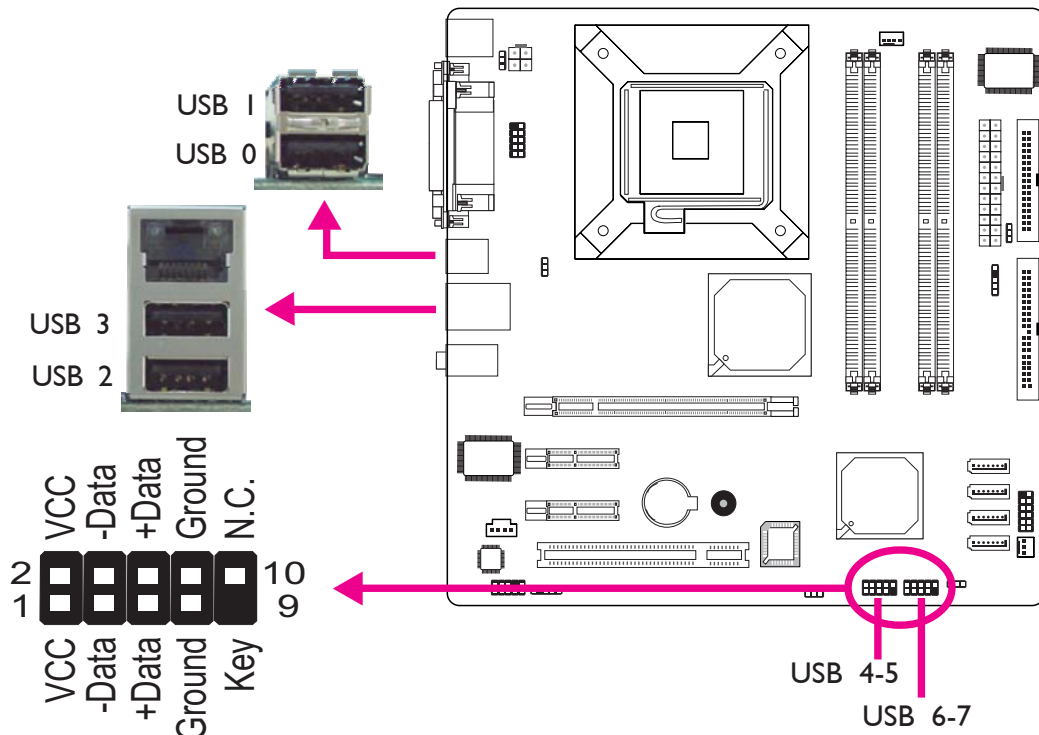
### BIOS Setting

Configure the onboard VGA in the Advanced Chipset Features submenu of the BIOS. Refer to chapter 3 for more information.

### Driver Installation

Install the graphics driver. Refer to chapter 4 for more information.

## USB Ports



USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with four onboard USB 2.0/1.1 ports. The USB 4-5 and USB 6-7 connectors allow you to connect 4 additional USB 2.0/1.1 ports. The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the connector (that is attached to the USB port cables) to a USB connector:

## BIOS Setting

Configure the onboard USB in the Integrated Peripherals submenu ("Onboard Device" section) of the BIOS. Refer to chapter 3 for more information.

## Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to your operating system's manual or documentation for more information.

Refer to chapter 4 for more information about installing the USB 2.0 driver.

## Wake-On-USB Keyboard/Mouse

The Wake-On-USB Keyboard/Mouse function allows you to use a USB device to wake up a system from the S3 (STR - Suspend To RAM) state. To use this function:

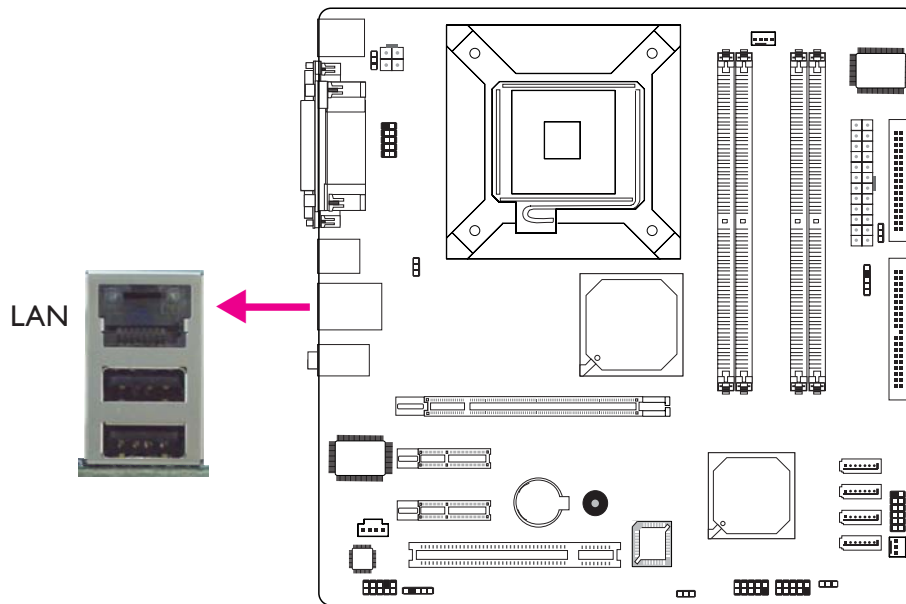
- **Jumper Setting:**  
JP1 and/or JP2 must be set to "2-3 On: 5V\_standby". Refer to "USB Power Select" in this chapter for more information.
- **BIOS Setting:**  
"USB KB Wake-Up From S3" in the Power Management Setup submenu of the BIOS must be set to Enabled. Refer to chapter 3 for more information.



### Important:

*If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V\_standby power source of your power supply must support  $\geq 1.5A$ . For 3 or more USB ports, the 5V\_standby power source of your power supply must support  $\geq 2A$ .*

## RJ45 LAN Port



The RJ45 LAN port allows the system board to connect to a local area network by means of a network hub.

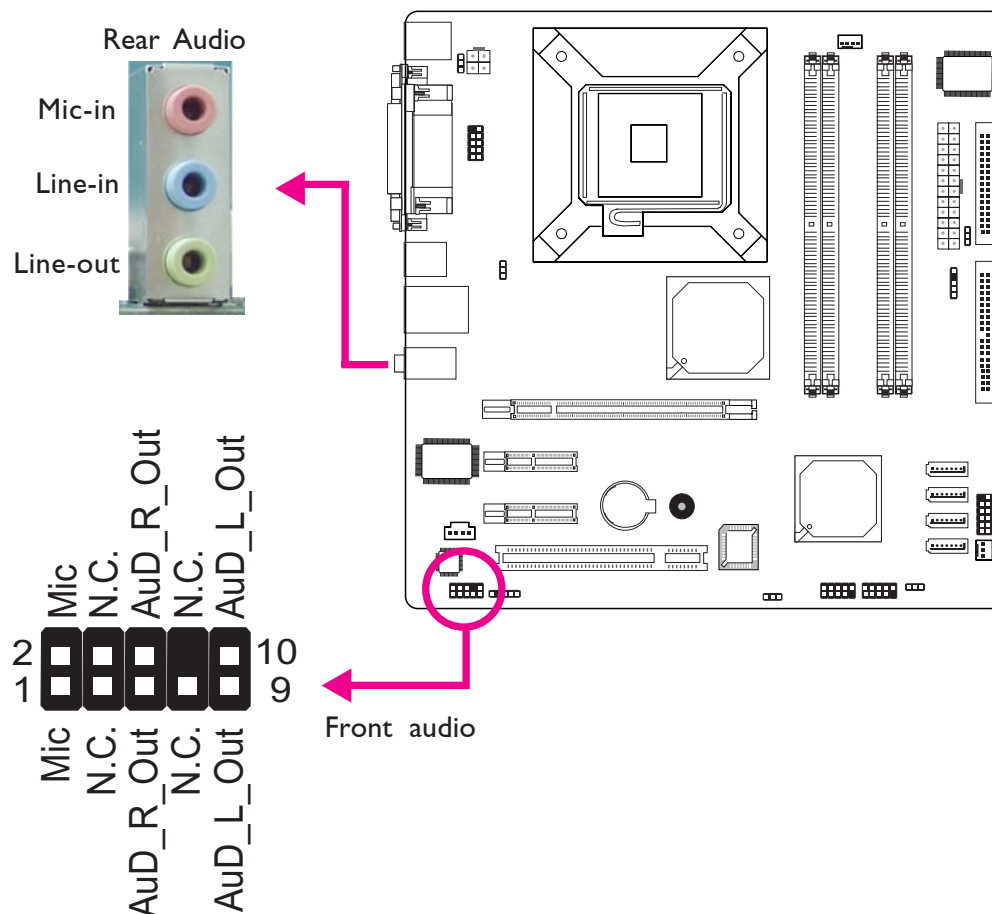
### BIOS Setting

Configure the onboard LAN in the in the Integrated Peripherals submenu ("Onboard Device" section) of the BIOS. Refer to chapter 3 for more information.

### Driver Installation

Install the LAN driver. Refer to chapter 4 for more information.

## Audio



### Rear Audio

- Line-in (Light Blue)**  
 In a 2-channel or 4-channel mode, this jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc. In a 6-channel mode, this jack functions as Center/Subwoofer.
- Line-out (Lime)**  
 In a 2-channel mode, this jack is used to connect a headphone or external speakers. In a 4-channel or 6-channel mode, this jack functions as front right/left speaker out.
- Mic-in (Pink)**  
 In a 2-channel mode, this jack is used to connect an external microphone. In a 4-channel or 6-channel mode, this jack functions as rear right/left speaker out.

	2-channel	4-channel	6-channel
Light Blue	Line-in	Line-in	Center/Subwoofer
Lime	Line-out	Front R/L	Front R/L
Pink	Mic-in	Rear R/L	Rear R/L

### Front Audio

The front audio connector allows you to connect to the line-out and mic-in jacks that are at the front panel of your system. Using this connector will disable the rear audio's line-out and mic-in functions.

Remove the jumper caps from pins 5-6 and pins 9-10 of the front audio connector prior to connecting the front audio cable connector. Make sure pin 1 of the cable connector is aligned with pin 1 of the front audio connector. If you are not using this connector, make sure to replace the jumper caps back to their original pin locations.

Pins 5-6 and 9-10 short  
(default)

The front audio is disabled.  
The rear audio is enabled.

Pins 5-6 and 9-10 open

The front audio is enabled.  
The rear audio is disabled.

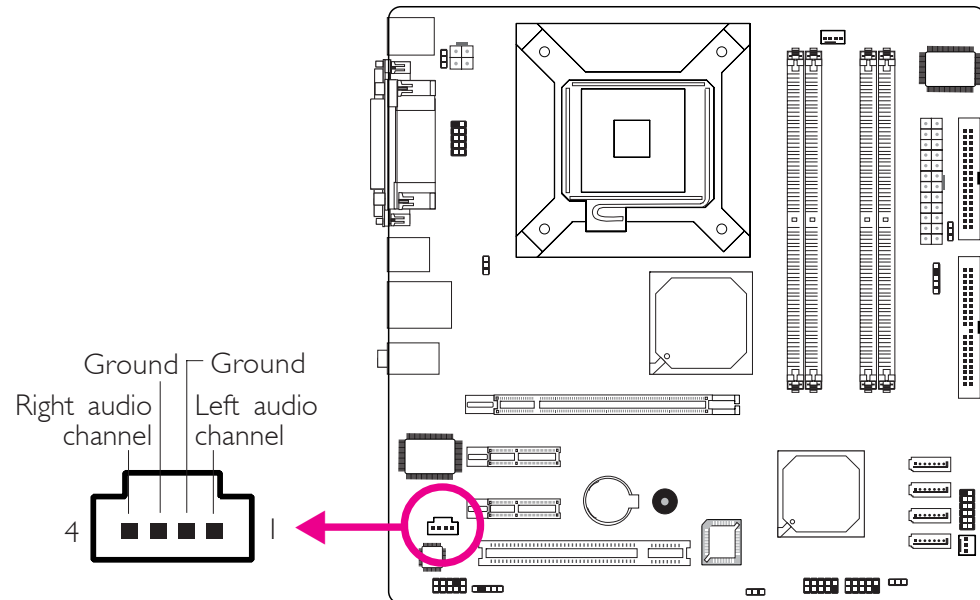
### Driver Installation

Install the audio driver. An audio software application program will at the same time install in your system. Refer to chapter 4 for more information.



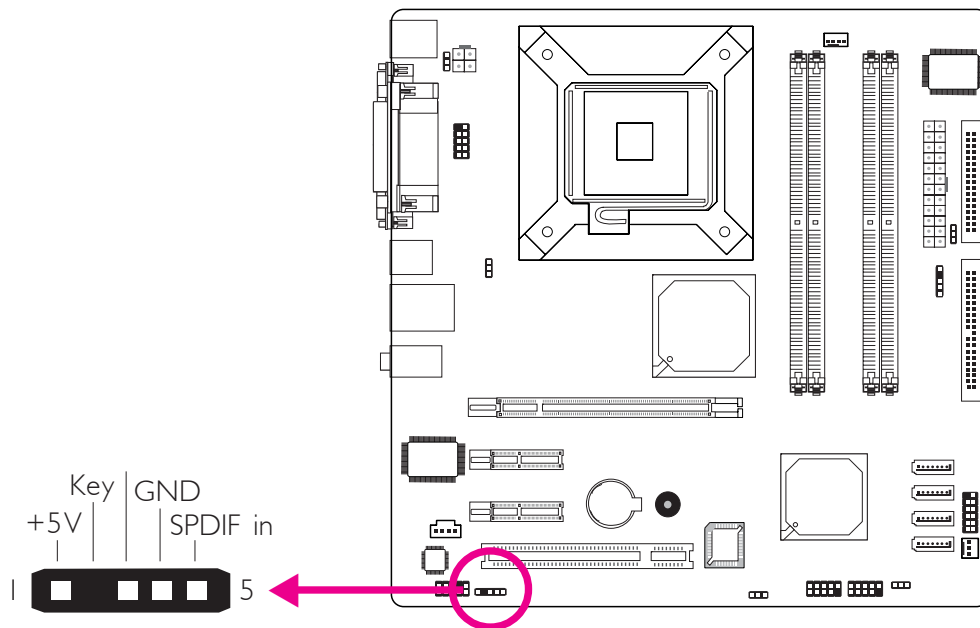
## I/O Connectors

### CD-in Internal Audio Connector



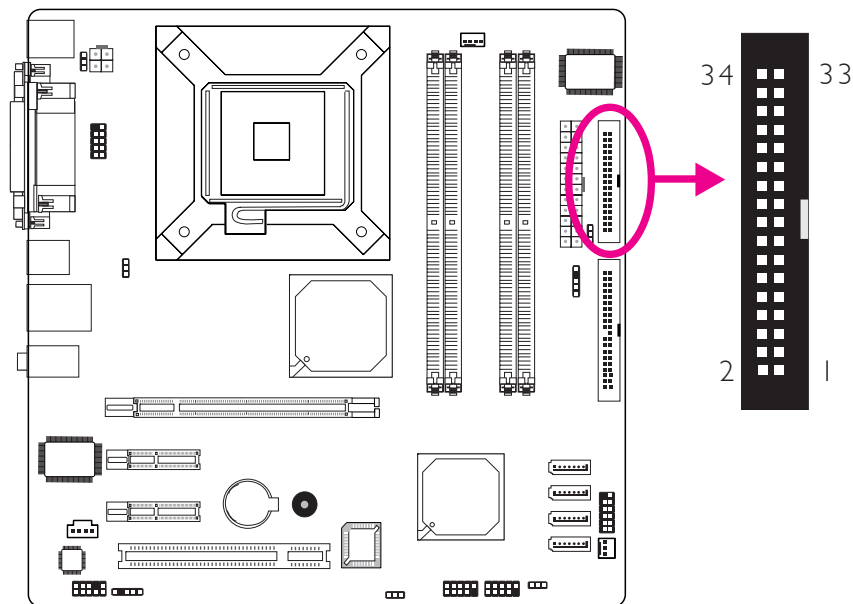
The CD-in connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

## S/PDIF Connector



The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable connector to this connector. Make sure pin 1 of the audio cable connector is aligned with pin 1 of the connector.

## Floppy Disk Drive Connector



The floppy disk drive connector supports standard floppy disk drives. The 34-pin connector on the floppy cable can be placed into the header only if pin 1 of the connector is aligned with pin 1 of the header.

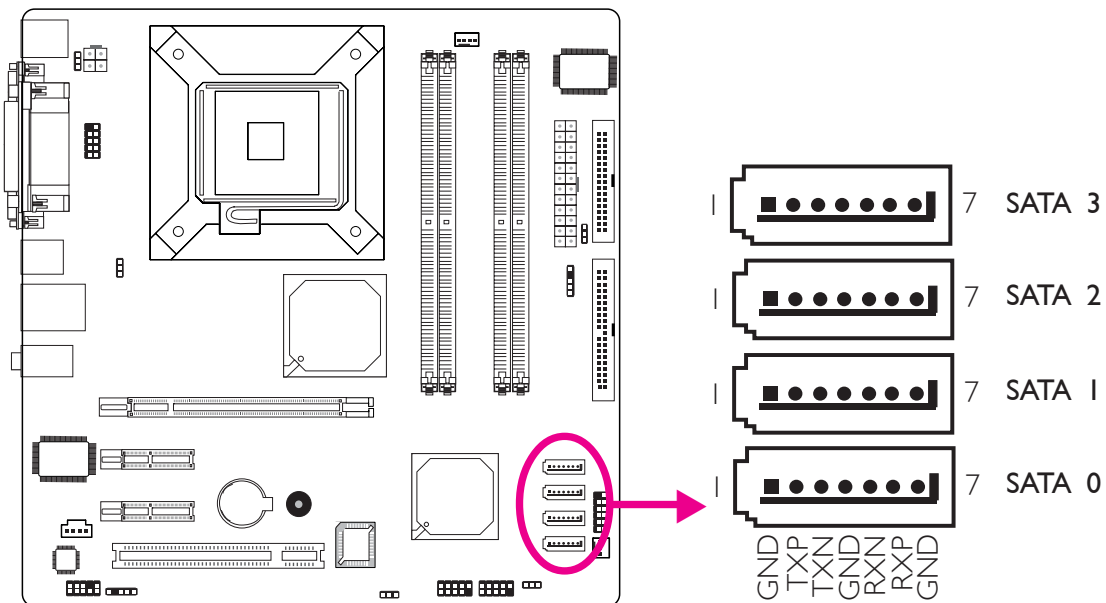
### Connecting the Floppy Disk Drive Cable

Install one end of the floppy disk drive cable into the shrouded floppy disk header on the system board and the other end-most connector to the drive you want to designate as Drive A. If you are connecting another drive (Drive B), install the middle connector of the cable to the drive. The colored edge of the daisy chained ribbon cable should be aligned with pin 1 of the header.

### BIOS Setting

Enable or disable this function in the Integrated Peripherals submenu ("Super I/O Device" field) of the BIOS. Refer to chapter 3 for more information.

## Serial ATA Connectors

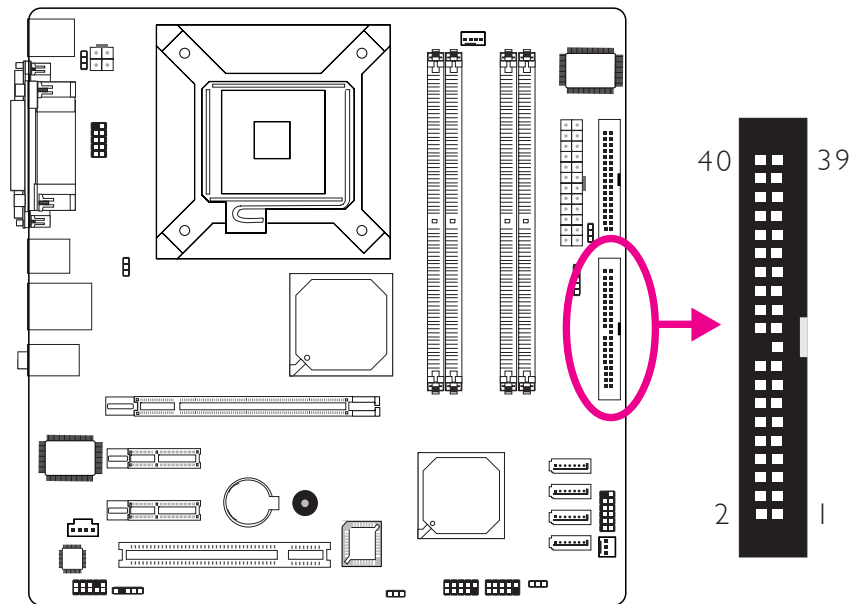


The four Serial ATA connectors are used for connecting Serial ATA devices. Connect one end of the Serial ATA cable to a connector and the other end to your Serial ATA device.

### BIOS Setting

Configure the Serial ATA drives in the Integrated Peripherals submenu ("OnChip IDE Device" field) of the BIOS. Refer to chapter 3 for more information.

## IDE Disk Drive Connector



The IDE header will interface two Enhanced IDE (Integrated Drive Electronics) disk drives. The 40-pin connector on the IDE cable can be placed into the header only if pin 1 of the connector is aligned with pin 1 of the header.

### Connecting the IDE Disk Drive Cable

The IDE connector supports 2 devices, a Master and a Slave. Use an IDE ribbon cable to connect the drives to the system board. An IDE ribbon cable has 3 connectors on them, one that plugs into an IDE connector on the system board and the other 2 connect to IDE devices. The connector at the end of the cable is for the Master drive and the connector in the middle of the cable is for the Slave drive.

Install one end of the IDE cable into the IDE header on the system board and the other connectors to the IDE devices.



#### Note:

*Refer to your disk drive user's manual for information about selecting proper drive switch settings.*

### Adding a Second IDE Disk Drive

When using two IDE drives, one must be set as the master and the other as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives.

The system board supports Enhanced IDE or ATA-2, ATA/33, ATA/66 or ATA/100 hard drives. We recommend that you use hard drives from the same manufacturer. In a few cases, drives from two different manufacturers will not function properly when used together. The problem lies in the hard drives, not the system board.



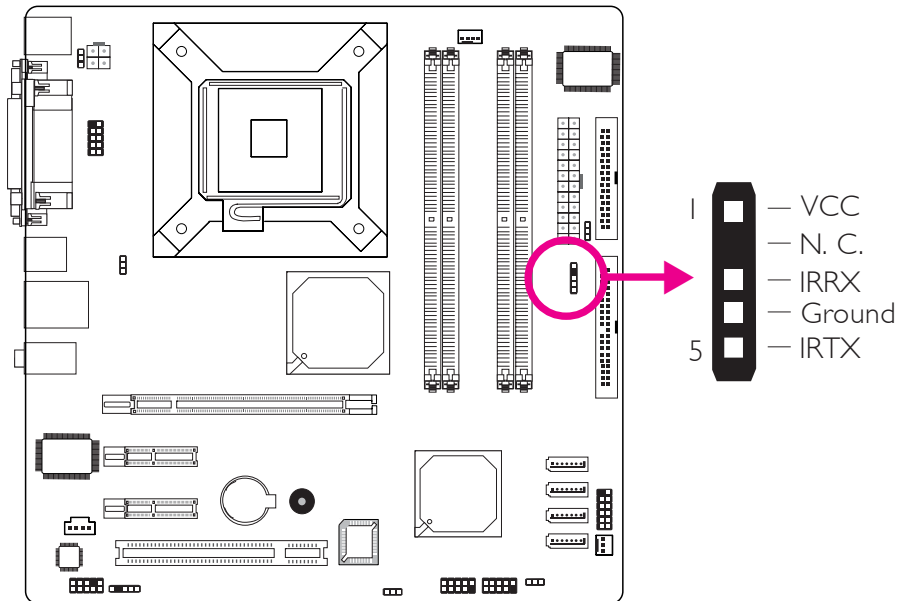
**Important:**

*If you encountered problems while using an ATAPI CD-ROM drive that is set in Master mode, please set the CD-ROM drive to Slave mode. Some ATAPI CD-ROMs may not be recognized and cannot be used if incorrectly set in Master mode.*

### BIOS Setting

Configure the onboard IDE in the Integrated Peripherals submenu ("OnChip IDE Device" field) of the BIOS. Refer to chapter 3 for more information.

## IrDA Connector



Connect the cable connector from your IrDA module to the IrDA connector.



### Note:

*The sequence of the pin functions on some IrDA cable may be reversed from the pin function defined on the system board. Make sure to connect the cable connector to the IrDA connector according to their pin functions.*

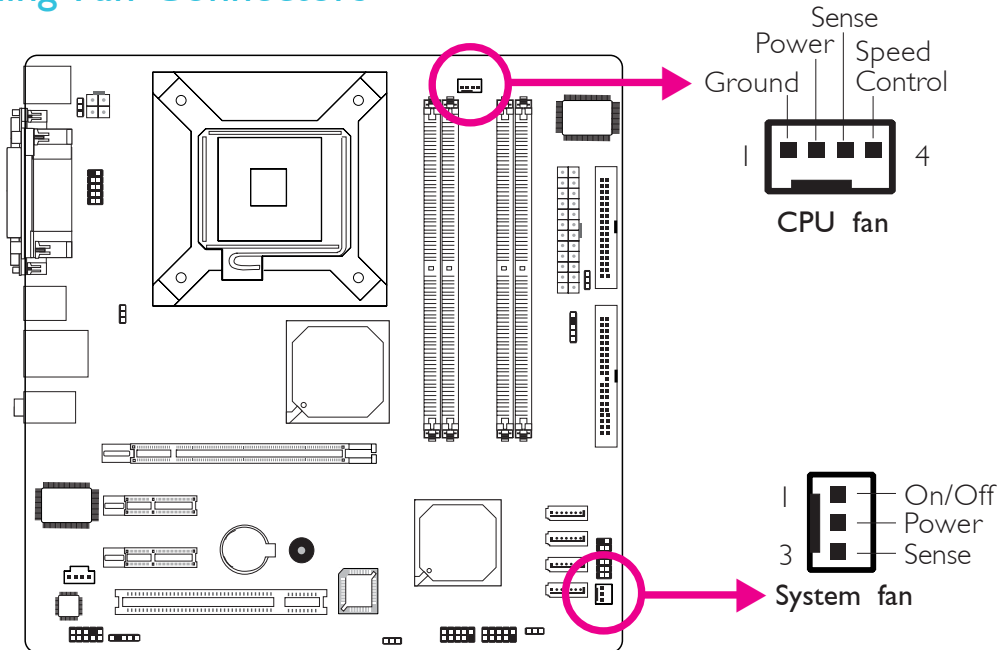
## BIOS Setting

Configure IrDA in the Integrated Peripherals submenu ("Super IO Device" field) of the BIOS. Refer to chapter 3 for more information.

## Driver Installation

You may need to install the proper drivers in your operating system to use the IR function. Refer to your operating system's manual or documentation for more information.

## Cooling Fan Connectors



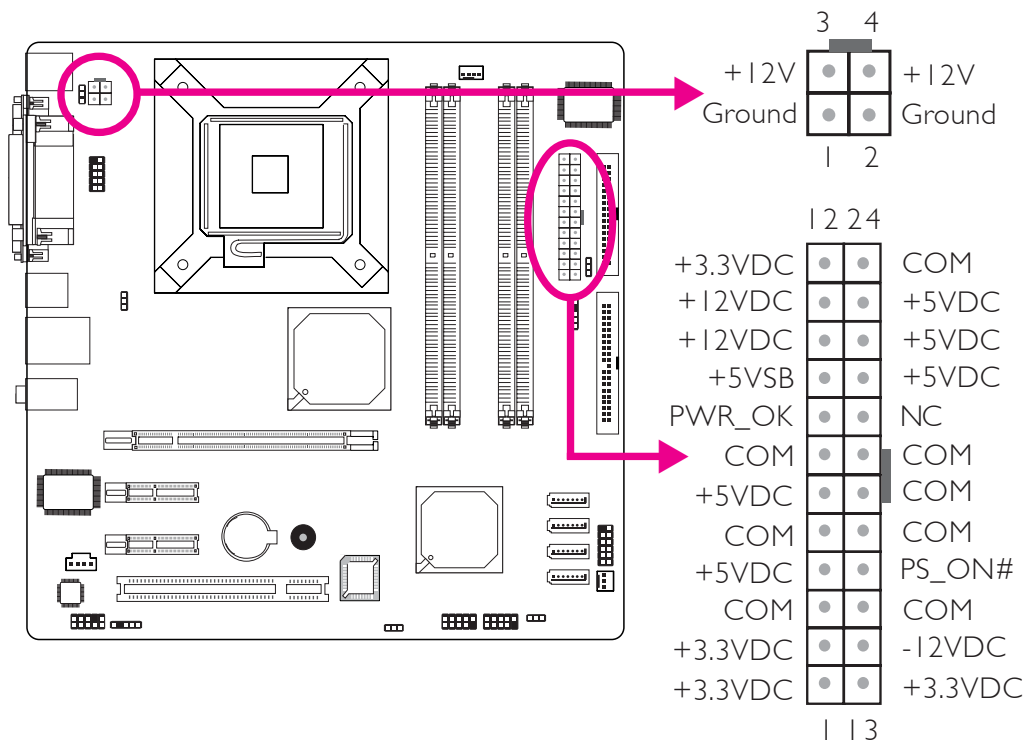
Connect the CPU fan's cable connector to the CPU fan connector on the system board. The system fan connector is used to connect an additional cooling fan. The cooling fans will provide adequate air-flow throughout the chassis to prevent overheating the CPU and system board components.

## BIOS Setting

The "PC Health Status" submenu of the BIOS will display the current speed of the cooling fans. Refer to chapter 3 for more information.



## Power Connectors



We recommend that you use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply has a standard 24-pin ATX main power connector and a 4-pin +12V power connector that must be inserted onto their corresponding connectors.

The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

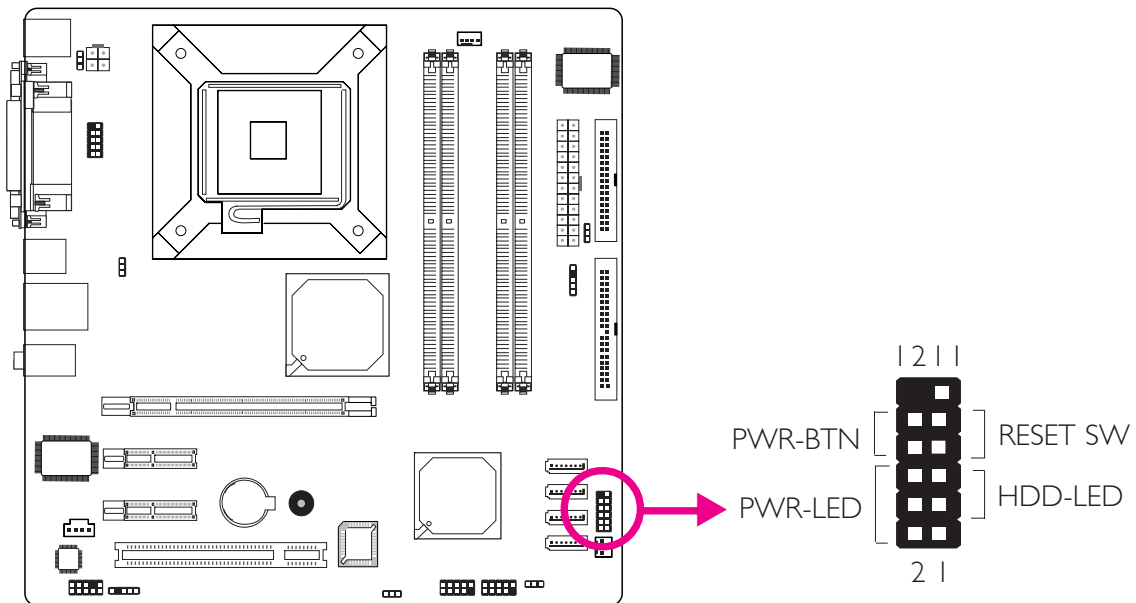
The system board requires a minimum of 300 Watt power supply to operate. Your system configuration (CPU power, amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, **we strongly recommend that you use a minimum of 400 Watt (or greater) power supply.**



### Important:

*Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.*

## Front Panel Connectors

**HDD-LED - HDD LED**

This LED will light when the hard drive is being accessed.

**RESET SW - Reset Switch**

This switch allows you to reboot without having to power off the system.

**PWR-BTN - Power Switch**

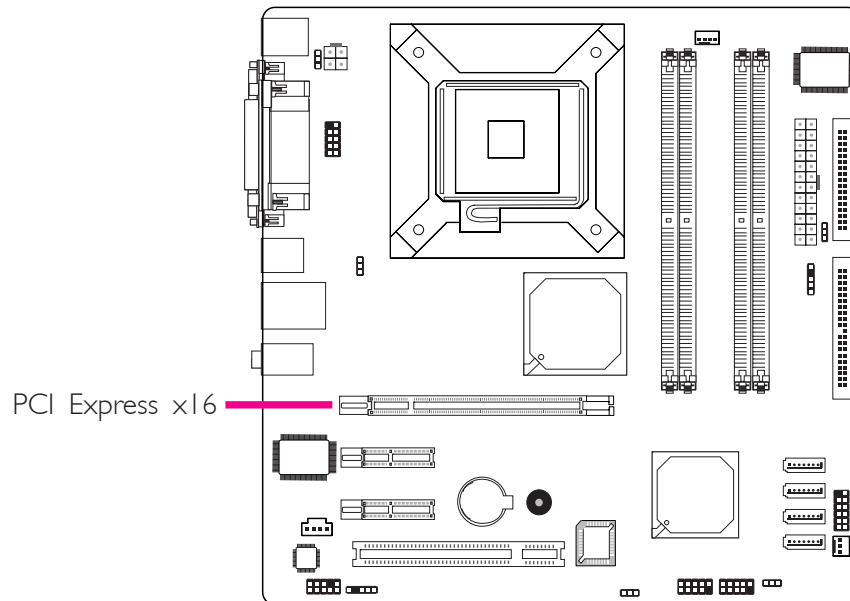
This switch is used to power on or off the system.

**PWR-LED - Power/Standby LED**

When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

	Pin	Pin Assignment		Pin	Pin Assignment
N. C.	1	N. C.	PWR-LED	2	LED Power
				4	LED Power
				6	Signal
HDD-LED	3	HDD Power	PWR-BTN	8	3V_DUAL
	5	Signal		10	Signal
RESET SW	7	Ground			
	9	RST Signal			
N. C.	11	N. C.	Key	12	Key

## PCI Express x16 Slot



Install PCI Express x16 graphics card, that comply to the PCI Express specifications, into the PCI Express x16 slot. To install a graphics card into the x16 slot, align the graphics card above the slot then press it down firmly until it is completely seated in the slot. The retaining clip will automatically hold the graphics card in place.

## Chapter 3 - BIOS Setup

### Award BIOS Setup Utility

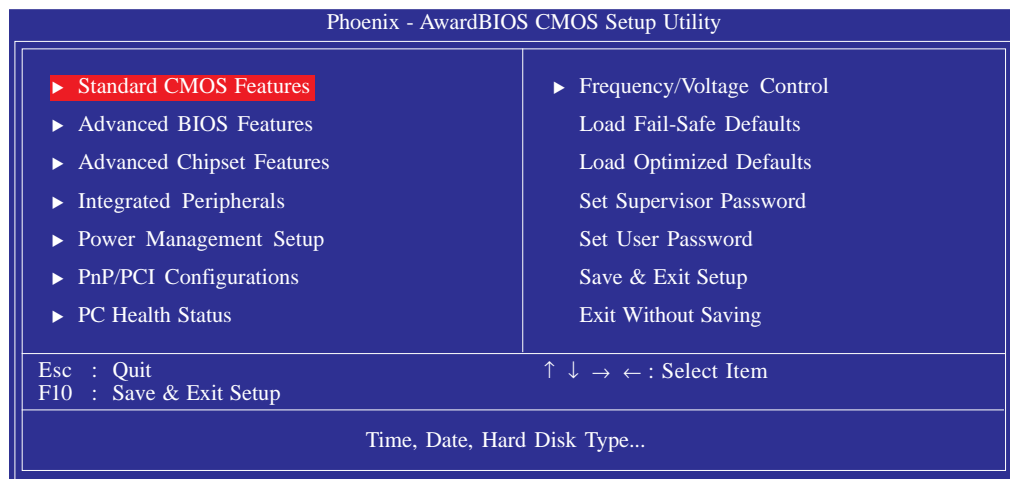
The Basic Input/Output System (BIOS) is a program that takes care of the basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features found in this system board. This chapter explains the Setup Utility for the Award BIOS.

After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the following message will appear on the screen:

Press DEL to enter setup

If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

When you press <Del>, the main menu screen will appear:



## Standard CMOS Features

Use the arrow keys to highlight “Standard CMOS Features” then press <Enter>. A screen similar to the one below will appear.

Phoenix - AwardBIOS CMOS Setup Utility		
Standard CMOS Features		
Date <mm:dd:yy>	Tue, <b>Nov</b> 26 2007	Item Help
Time <hh:mm:ss>	9 : 3 : 54	
▶ IDE Channel 0 Master	None	Menu Level ▶
▶ IDE Channel 0 Slave	None	
▶ IDE Channel 1 Master	None	Change the day, month, year and century
▶ IDE Channel 1 Slave	None	
Drive A	None	
Drive B	None	
Video	EGA/VGA	
Halt On	All Errors	
Base Memory	640K	
Extended Memory	505172K	
Total Memory	516096K	

↑↓→←: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

The settings on the screen are for reference only. Your version may not be identical to this one.

### Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

### Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

## IDE Channel 0 Master, IDE Channel 0 Slave, IDE Channel 1 Master and IDE Channel 1 Slave

To configure an IDE drive, move the cursor to a field then press <Enter>. The following screen will appear:

Phoenix - AwardBIOS CMOS Setup Utility		
IDE Channel 0 Master		
IDE HDD Auto-Detection	<b>Press Enter</b>	Item Help
IDE Channel 0 Master	Auto	Menu Level ►  To auto-detect the HDD's size, head... on this channel
Access Mode	Auto	
Capacity	0 MB	
Cylinder	0	
Head	0	
Precomp	0	
Landing Zone	0	
Sector	0	

↑↓→←: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

The settings on the screen are for reference only. Your version may not be identical to this one.

### IDE HDD Auto-Detection

Detects the parameters of the drive. The parameters will automatically be shown on the screen.

### IDE Channel 0 Master

If you select "Auto", the BIOS will auto-detect the HDD & CD-ROM drive at the POST stage and show the IDE for the HDD & CD-ROM drive. If a hard disk has not been installed, select "None".

### Access Mode

For hard drives larger than 528MB, you would typically select the LBA type. Certain operating systems require that you select CHS or Large. Please check your operating system's manual or Help desk on which one to select.

### Capacity

Displays the approximate capacity of the disk drive. Usually the size is slightly greater than the size of a formatted disk given by a disk checking program.

### Cylinder

This field displays the number of cylinders.

### Head

This field displays the number of read/write heads.

### Precomp

This field displays the number of cylinders at which to change the write timing.

### Landing Zone

This field displays the number of cylinders specified as the landing zone for the read/write heads.

### Sector

This field displays the number sectors per track.

### Drive A and Drive B

These fields identify the types of floppy disk drives installed.

<i>None</i>	No floppy drive is installed
<i>360K, 5.25 in.</i>	5-1/4 in. standard drive; 360KB capacity
<i>1.2M, 5.25 in.</i>	5-1/4 in. AT-type high-density drive; 1.2MB capacity
<i>720K, 3.5 in.</i>	3-1/2 in. double-sided drive; 720KB capacity
<i>1.44M, 3.5 in.</i>	3-1/2 in. double-sided drive; 1.44MB capacity
<i>2.88M, 3.5 in.</i>	3-1/2 in. double-sided drive; 2.88MB capacity

### Video

This field selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type. The default setting is EGA/VGA.

<i>EGA/VGA</i>	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA and PGA monitor adapters.
<i>CGA 40</i>	Color Graphics Adapter. Power up in 40-column mode.
<i>CGA 80</i>	Color Graphics Adapter. Power up in 80-column mode.
<i>Mono</i>	Monochrome adapter. Includes high resolution monochrome adapters.

### Halt On

This field determines whether the system will stop if an error is detected during power up. The default setting is All Errors.

<i>No Errors</i>	The system boot will not stop for any errors detected.
<i>All Errors</i>	The system boot will stop whenever the BIOS detects a non-fatal error.
<i>All, But Keyboard</i>	The system boot will not stop for a keyboard error; it will stop for all other errors.
<i>All, But Diskette</i>	The system boot will not stop for a disk error; it will stop for all other errors.
<i>All, But Disk/Key</i>	The system boot will not stop for a disk or keyboard error; it will stop for all other errors.

### Base Memory

Displays the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard or 640K for systems with 640K or more memory installed on the motherboard.



### Extended Memory

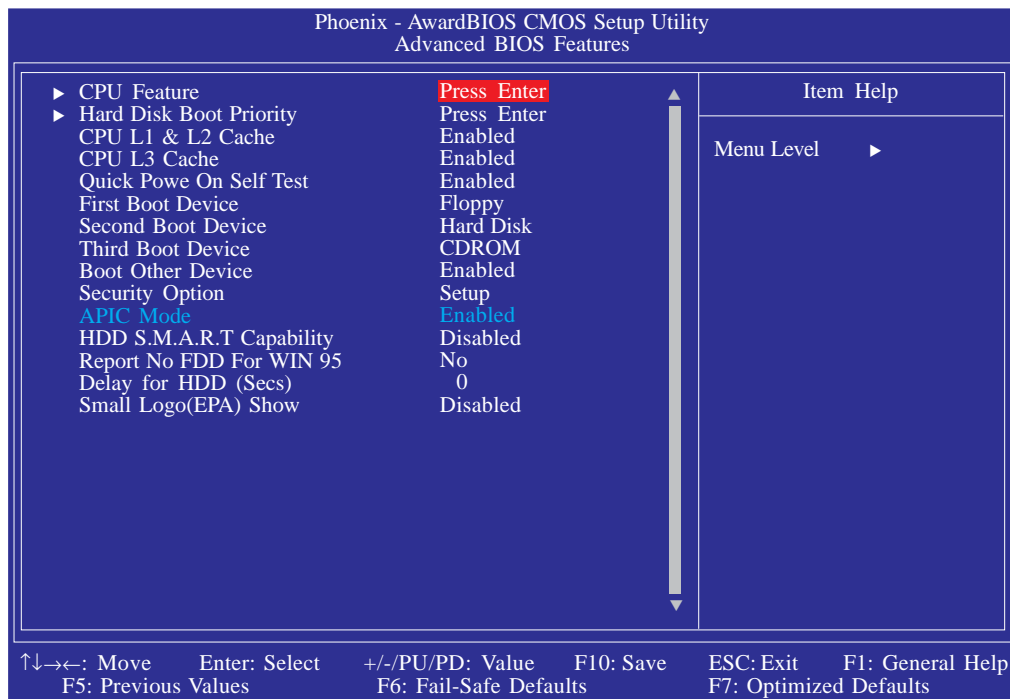
Displays the amount of extended memory detected during boot-up.

### Total Memory

Displays the total memory available in the system.

## Advanced BIOS Features

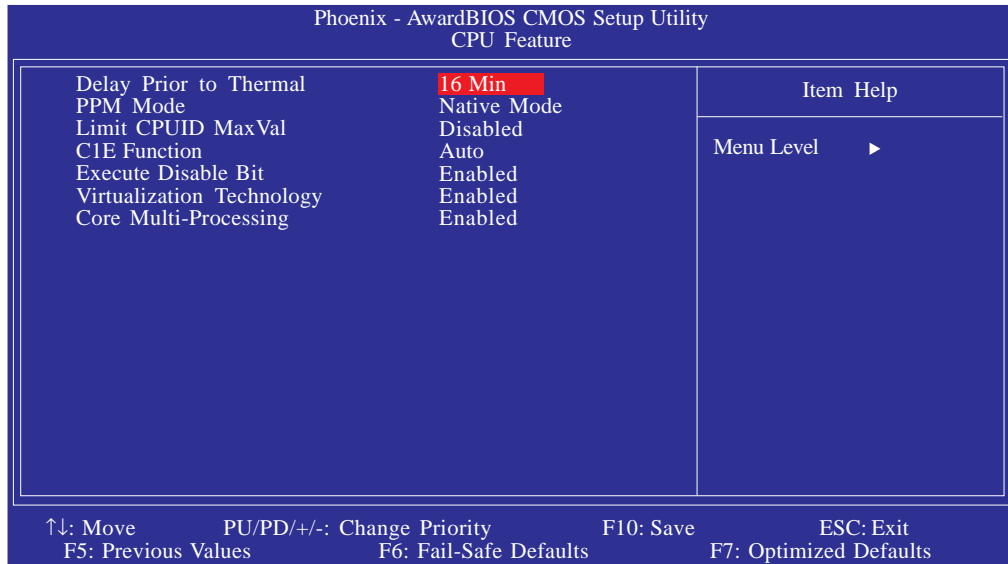
The Advanced BIOS Features allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.



The screen above lists all the fields available in the Advanced BIOS Features submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

## CPU Feature

This field is used to configure the CPU that is installed on the system board. Move the cursor to this field then press <Enter>.



The settings on the screen are for reference only. Your version may not be identical to this one.

### Delay Prior To Thermal

This field is used to select the time that would force the CPU to a 50% duty cycle when it exceeds its maximum operating temperature therefore protecting the CPU and the system board from overheating to ensure a safe computing environment..

### PPM Mode

The options are Native Mode and SMM mode.

### Limit CPUID MaxVal

The CPUID instruction of some newer CPUs will return a value greater than 3. Problems will occur only in certain operating systems. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or lesser than 3.

### CIE Function

The options are Auto and Disabled.

### Execute Disable Bit

When this field is set to Disabled, it will force the XD feature flag to always return to 0.

### Virtualiation Technology

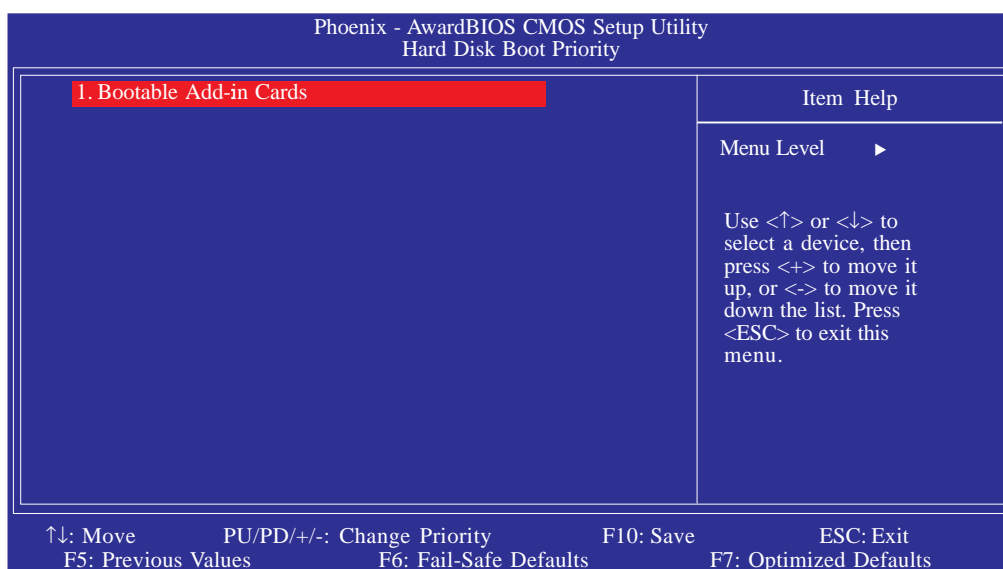
When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

### Core Multit-processing

The options are Enabled and Disabled.

## Hard Disk Boot Priority

This field is used to select the boot sequence of the hard drives. Move the cursor to this field then press <Enter>. Use the Up or Down arrow keys to select a device then press <+> to move it up or <-> to move it down the list.



The settings on the screen are for reference only. Your version may not be identical to this one.

## CPU L1 and L2 Cache

This field is used to speed up the memory access. Enable the external cache for better performance.

## CPU L3 Cache

This field is used to enable or disable the CPU's L3 cache.

## Quick Power On Self Test

This field speeds up Power On Self Test (POST) after you power on the system. When Enabled, the BIOS will shorten or skip some check items during POST.

## First Boot Device, Second Boot Device, Third Boot Device and Boot Other Device

Select the drive to boot first, second and third in the "First Boot Device", "Second Boot Device" and "Third Boot Device" fields re-

spectively. The BIOS will boot the operating system according to the sequence of the drive selected. Set “Boot Other Device” to Enabled if you wish to boot from another device.

### Security Option

This field determines when the system will prompt for the password - everytime the system boots or only when you enter the BIOS setup. Set the password in the Set Supervisor/User Password submenu.

- System* The system will not boot and access to Setup will be denied unless the correct password is entered at the prompt.
- Setup* The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

### APIC Mode

Leave this field in its default setting.

### HDD S.M.A.R.T. Capability

The system board supports SMART (Self-Monitoring, Analysis and Reporting Technology) hard drives. SMART is a reliability prediction technology for ATA/IDE and SCSI drives. The drive will provide sufficient notice to the system or user to backup data prior to the drive's failure. The default is Disabled. If you are using hard drives that support S.M.A.R.T., set this field to Enabled. SMART is supported in ATA/33 or later hard drives.

### Report No FDD For WIN 95

The options are Yes and No.

### Delay for HDD (Secs)

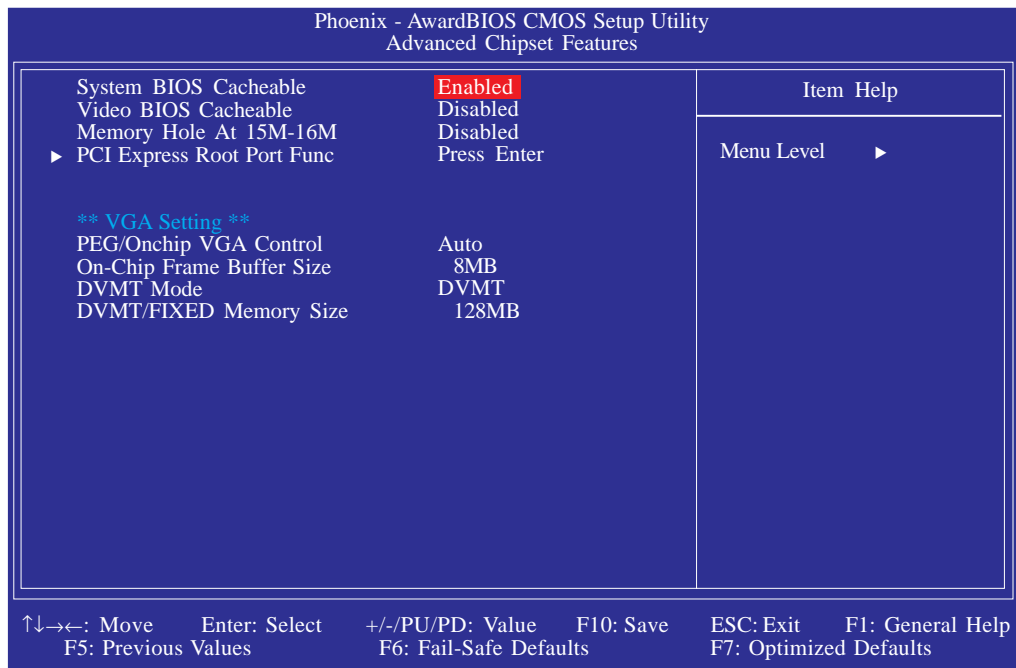
This field is used to select the time that would delay the HDD controller's initial time. This is specially useful for some HDDs which will not be ready at first boot when you power-on the system.

### Small Logo(EPA) Show

*Enabled* The EPA logo will appear during system boot-up.

*Disabled* The EPA logo will not appear during system boot-up.

## Advanced Chipset Features



The settings on the screen are for reference only. Your version may not be identical to this one.

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources. **These items should not be altered unless necessary.** The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered some incompatibility or that data was being lost while using your system.

### System BIOS Cacheable

When this field is enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled. The larger the range of the Cache RAM, the higher the efficiency of the system.

### Video BIOS Cacheable

As with caching the system BIOS, enabling the Video BIOS cache will allow access to video BIOS addressed at C0000H to C7FFFH to be cached, if the cache controller is also enabled. The larger the range of the Cache RAM, the faster the video performance.



## Memory Hole At 15M-16M

In order to improve system performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16MB. When enabled, the CPU assumes the 15-16MB memory range is allocated to the hidden ISA address range instead of the actual system DRAM. When disabled, the CPU assumes the 15-16MB address range actually contains DRAM memory. If more than 16MB of system memory is installed, this field must be disabled to provide contiguous system memory.

## PCI Express Root Port Func

Move the cursor to this field and press <Enter>. The following screen will appear:

The screenshot shows the 'Phoenix - AwardBIOS CMOS Setup Utility' screen with the 'PCI Express Root Port Func' menu selected. The menu lists three items: 'PCI Express Port 1' (set to 'Auto'), 'PCI Express Port 2' (set to 'Auto'), and 'PCI-E Compliancy Mode' (set to 'v1.0a'). A red highlight is visible on the 'Auto' value for 'PCI Express Port 1'. To the right of the settings is a 'Menu Level' indicator with a right-pointing arrow. At the bottom of the screen, a legend explains the navigation keys: up/down/left/right for moving, Enter for selecting, +/-/PU/PD for changing values, F10 for saving, ESC for exiting, F1 for general help, F5 for previous values, F6 for fail-safe defaults, and F7 for optimized defaults.

Phoenix - AwardBIOS CMOS Setup Utility		PCI Express Root Port Func	
PCI Express Port 1	Auto	Item Help	Menu Level ►
PCI Express Port 2	Auto		
PCI-E Compliancy Mode	v1.0a		

↑↓→←: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

The settings on the screen are for reference only. Your version may not be identical to this one.

## PCI Express Port 1 to PCI Express Port 2

These fields are used to enable or disable the PCI Express port function.

## PCI-E Compliancy Mode

This field is used to select the mode for the PCI Express add-in card.

### PEG/Onchip VGA Control

This field is used to select the graphics controller that will serve as the primary boot device. The options are Auto, Onchip VGA and PEG Port.

### On-Chip Frame Buffer Size

This field is used to select the onboard VGA's frame buffer size that is shared from the system memory.

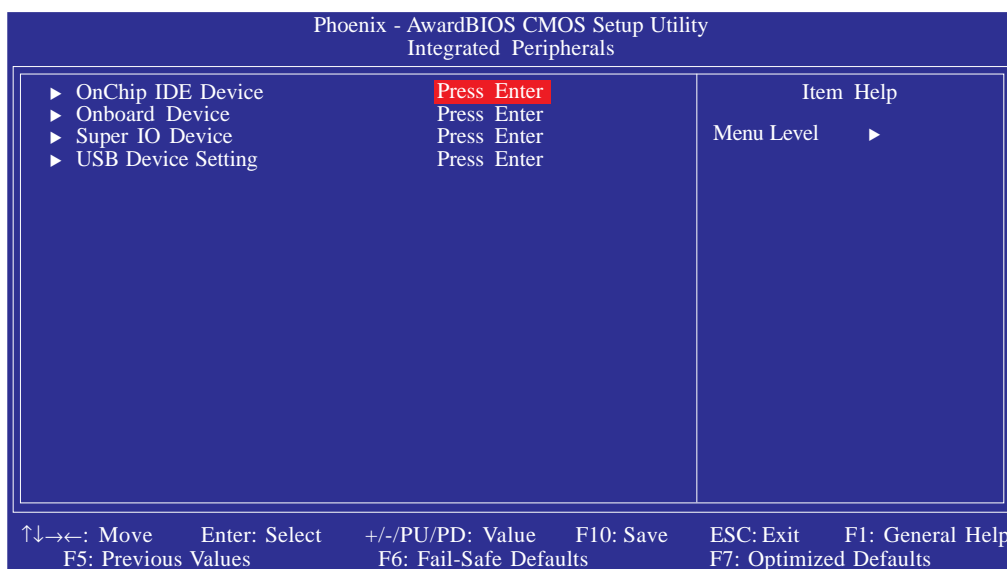
### DVMT Mode

This field shows the current DVMT mode.

### DVMT/Fixed Memory Size

This field is used to select the graphics memory size used by DVMT/Fixed mode.

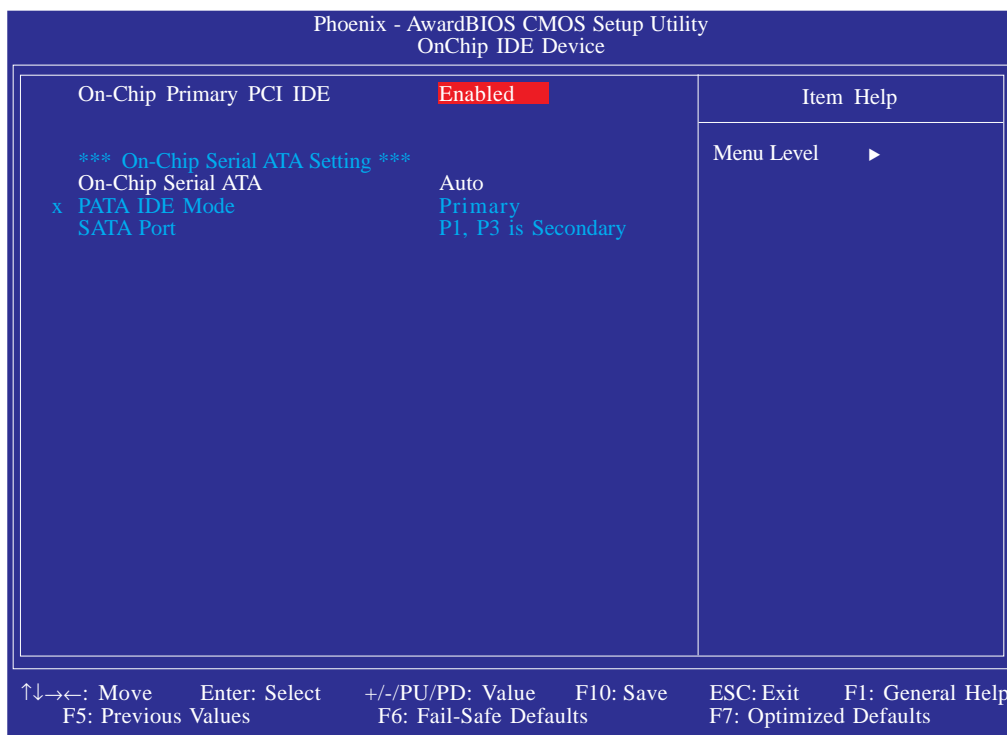
## Integrated Peripherals



The settings on the screen are for reference only. Your version may not be identical to this one.

## OnChip IDE Device

Move the cursor to this field and press <Enter>. The following screen will appear:



The settings on the screen are for reference only. Your version may not be identical to this one.

### On-Chip Primary PCI IDE

This field is used to enable or disable the primary IDE controller. The default is Enabled. Select Disabled if you want to add a different hard drive controller.

### On-Chip Serial ATA

<i>Disabled</i>	Disables the onboard SATA.
<i>Auto</i>	The system will detect the existing SATA and IDE drives then automatically set them to the available master/slave mode.
<i>Combined Mode</i>	This option allows you to combine both IDE and SATA drives; supporting maximum of 2 drives on each channel.
<i>Enhanced Mode</i>	This option allows you to use both IDE and SATA drives; allowing a maximum of 4 drives - 1 IDE Master, 1 IDE Slave and 2 SATA.
<i>SATA Only</i>	This option automatically sets the SATA drives to Primary Master mode. Since the SATA drives are in Master mode, you cannot set the IDE drive to Master mode.

### PATA IDE Mode

This field is used to select the function mode of the IDE connector and its relation to the SATA ports.

<i>Primary</i>	IDE 1 serves as Primary Master and Primary Slave channel. SATA 1 and SATA 3 serve as Secondary Master and Secondary Slave channel. SATA 0 and SATA 2 are disabled.
<i>Secondary</i>	IDE 1 serves as Secondary Master and Secondary Slave channel. SATA 0 and SATA 2 serve as Primary Master and Primary Slave channel. SATA 1 and SATA 3 are disabled.

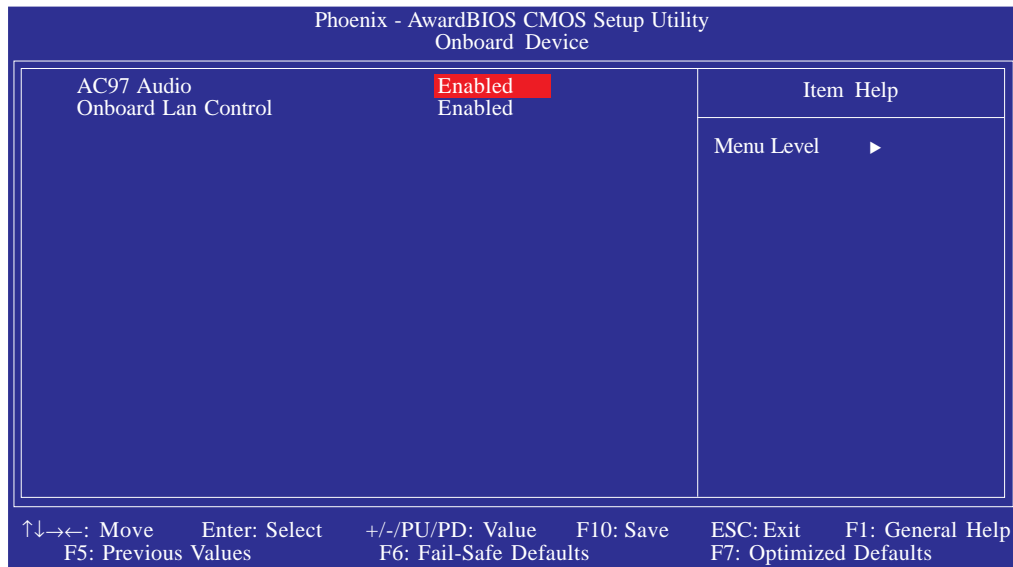
### SATA Port

If the "PATA IDE Mode" field is set to Primary, this field will show "P1, P3 is Secondary"; meaning SATA 1 and SATA 3 are Secondary.

If the “PATA IDE Mode” field is set to Secondary, this field will show “P0, P2 is Primary”; meaning SATA 0 and SATA 2 are Primary.

## Onboard Device

Move the cursor to this field and press <Enter>. The following screen will appear:



The settings on the screen are for reference only. Your version may not be identical to this one.

## AC97 Audio

*Enabled*      Select this option when using the onboard audio codec.

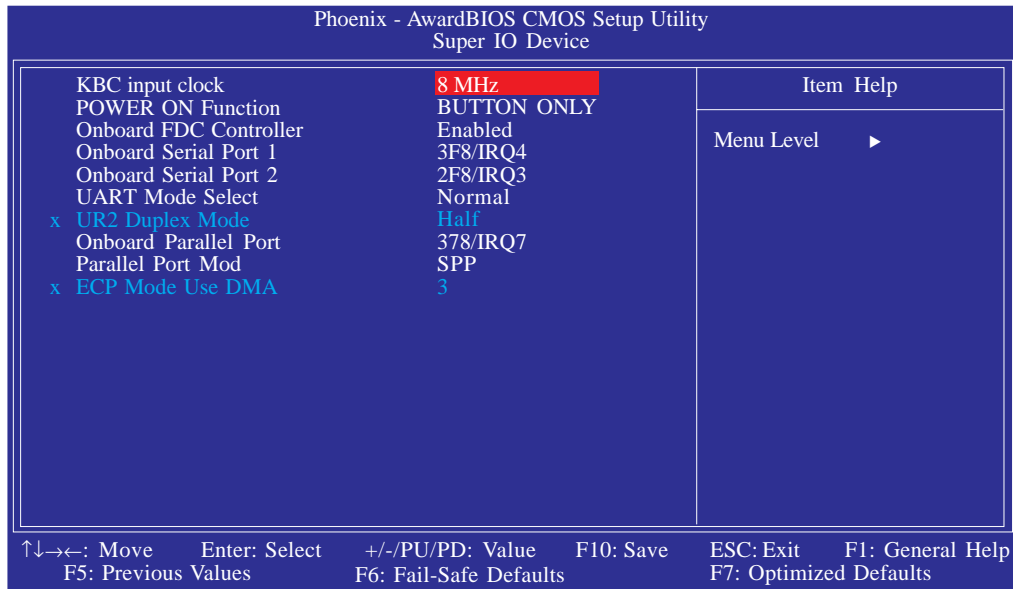
*Disabled*      Select this option when using a PCI sound card.

## Onboard LAN Control

This field is used to enable or disable the onboard LAN.

## Super IO Device

Move the cursor to this field and press <Enter>. The following screen will appear:



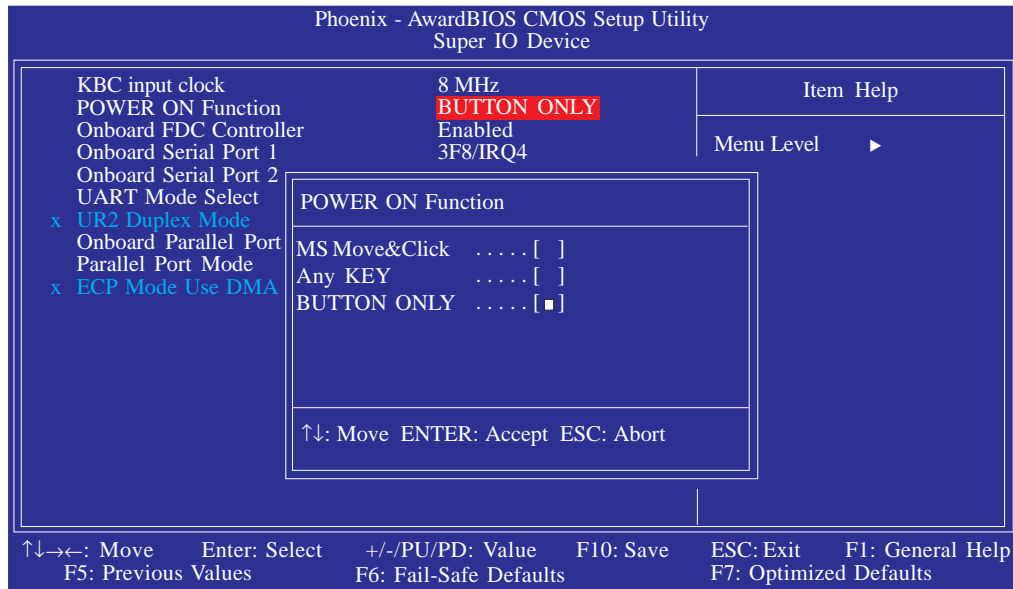
The settings on the screen are for reference only. Your version may not be identical to this one.

## KBC Input Clock

This is used to select the input clock of your keyboard. The options are 8MHz and 12MHz. The default is 8MHz.

## Power On Function

This field allows you to use the keyboard or PS/2 mouse to power-on the system.



The settings on the screen are for reference only. Your version may not be identical to this one.

- MS Move & Click* Move and click the PS/2 mouse to wake up the system.
- Any Key* Press any key to power-on the system.
- Button only* Default setting. Uses the power button to power-on the system.

## Onboard FDC Controller

- Enabled* Enables the onboard floppy disk controller.
- Disabled* Disables the onboard floppy disk controller.

## Onboard Serial Port 1 and Onboard Serial Port 2

- Auto* The system will automatically select an I/O address for the onboard serial port 1 and serial port 2.
- 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3* Allows you to manually select an I/O address for the onboard serial port 1 and serial port 2.
- Disabled* Disables the onboard serial port 1 and/or serial port 2.

## UART Mode Select



This field is used to select the type of IrDA standard supported by your IrDA device. For better transmission of data, your IrDA peripheral device must be within a 30° angle and within a distance of 1 meter.

### UR2 Duplex Mode

*Half* Data is completely transmitted before receiving data.

*Full* Transmits and receives data simultaneously.

### Onboard Parallel Port

*378/IRQ7, 3BC/IRQ7, 278/IRQ5* Selects the I/O address and IRQ for the onboard parallel port.

*Disabled* Disables the onboard parallel port.

### Parallel Port Mode

The options are SPP, EPP, ECP and ECP+EPP. These apply to a standard specification and will depend on the type and speed of your device. Refer to your peripheral's manual for the best option.

#### **SPP**

Allows normal speed operation but in one direction only.

#### **“ECP (Extended Capabilities Port)”**

Allows parallel port to operate in bidirectional mode and at a speed faster than the normal mode's data transfer rate.

#### **“EPP (Enhanced Parallel Port)”**

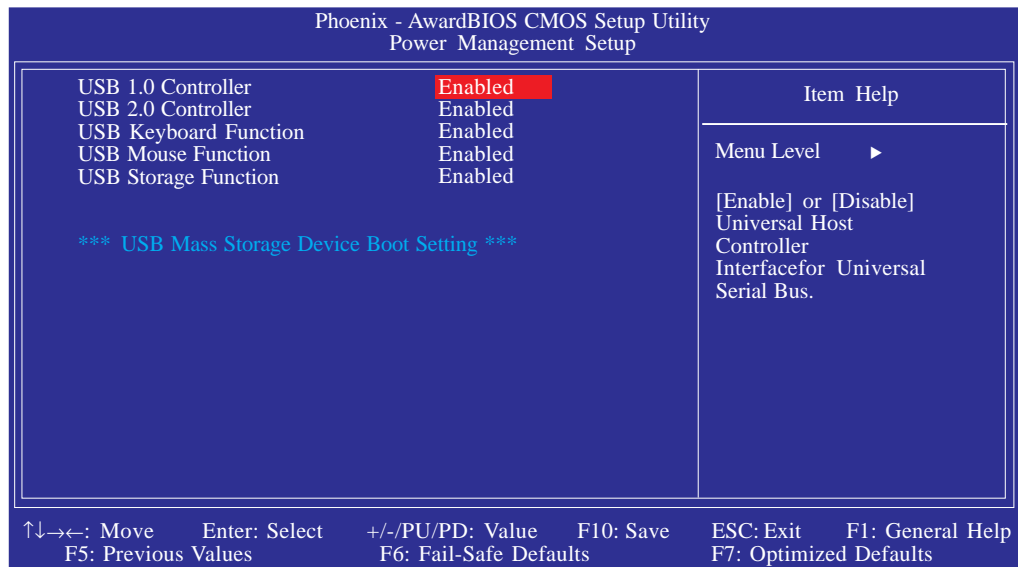
Allows bidirectional parallel port operation at maximum speed.

### ECP Mode Use DMA

This is used to select a DMA channel of the parallel port.

## USB Device Setting

Move the cursor to this field and press <Enter>. The following screen will appear:



The settings on the screen are for reference only. Your version may not be identical to this one.

### USB 1.0 Controller

This field is used to enable or disable the Universal Host Controller Interface (USB 1.0).

### USB 2.0 Controller

This field is used to enable or disable the Enhanced Host Controller Interface (USB 2.0).

### USB Keyboard Function

Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

### USB Mouse Function

Due to the limited space of the BIOS ROM, the support for legacy USB mouse (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

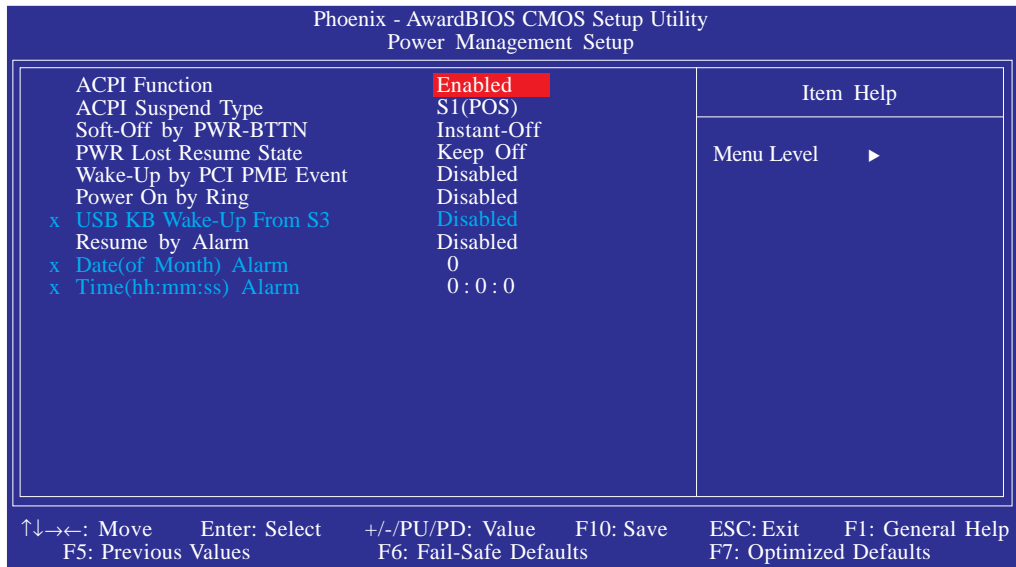
If a PS/2 mouse is not available and you need to use a USB mouse to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

### USB Storage Function

This field is used to enable or disable the support for legacy USB mass storage.

## Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy.



The settings on the screen are for reference only. Your version may not be identical to this one.

### ACPI Function

This function should be enabled only in operating systems that support ACPI. If you want to use the Suspend to RAM function, make sure this field is enabled then select "S3(STR)" in the "ACPI Suspend Type" field.

### ACPI Suspend Type

This field is used to select the type of Suspend mode.

- S1(POS)    Enables the Power On Suspend function.
- S3(STR)    Enables the Suspend to RAM function.

## Soft-Off by PWR-BTTN

This field allows you to select the method of powering off your system.

*Delay 4 Sec.* Regardless of whether the Power Management function is enabled or disabled, if the power button is pushed and released in less than 4 sec, the system enters the Suspend mode. The purpose of this function is to prevent the system from powering off in case you accidentally “hit” or pushed the power button. Push and release again in less than 4 sec to restore. Pushing the power button for more than 4 seconds will power off the system.

*Instant-Off* Pressing and then releasing the power button at once will immediately power off your system.

## PWR Lost Resume State

*Keep Off* When power returns after an AC power failure, the system’s power is off. You must press the Power button to power-on the system.

*Turn On* When power returns after an AC power failure, the system will automatically power-on.

*Last State* When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system’s power is off when AC power failure occurs, it will remain off when power returns. If the system’s power is on when AC power failure occurs, the system will power-on when power returns.

## Wake-Up by PCI PME Event

*Enabled* This field should be set to Enabled only if your PCI card such as LAN card or modem card uses the PCI PME (Power Management Event) signal to remotely wake up the system. Access to the LAN card or PCI card will cause the system to wake up. Refer to the card’s documentation for more information.

*Disabled* The system will not wake up despite access to the PCI card.

### Power On by Ring

Set this field to Enabled to use the modem ring-on function. This will allow your system to power-on to respond to calls coming from an external modem.

### USB KB Wake-Up From S3

This field, when enabled, allows you to use a USB keyboard to wake up a system that is in the S3 (STR - Suspend To RAM) state. This can be configured only if the "ACPI Suspend Type" field is set to "S3(STR)".

### Resume By Alarm

*Enabled* When Enabled, you can set the date and time you would like the Soft Power Down (Soft-Off) PC to power-on in the "Date (of Month) Alarm" and "Time (hh:mm:ss) Alarm" fields. However, if the system is being accessed by incoming calls or the network (Resume On Ring/LAN) prior to the date and time set in these fields, the system will give priority to the incoming calls or network.

*Disabled* Disables the automatic power-on function. (default)

### Date (of Month) Alarm

0 The system will power-on everyday according to the time set in the "Time (hh:mm:ss) Alarm" field.

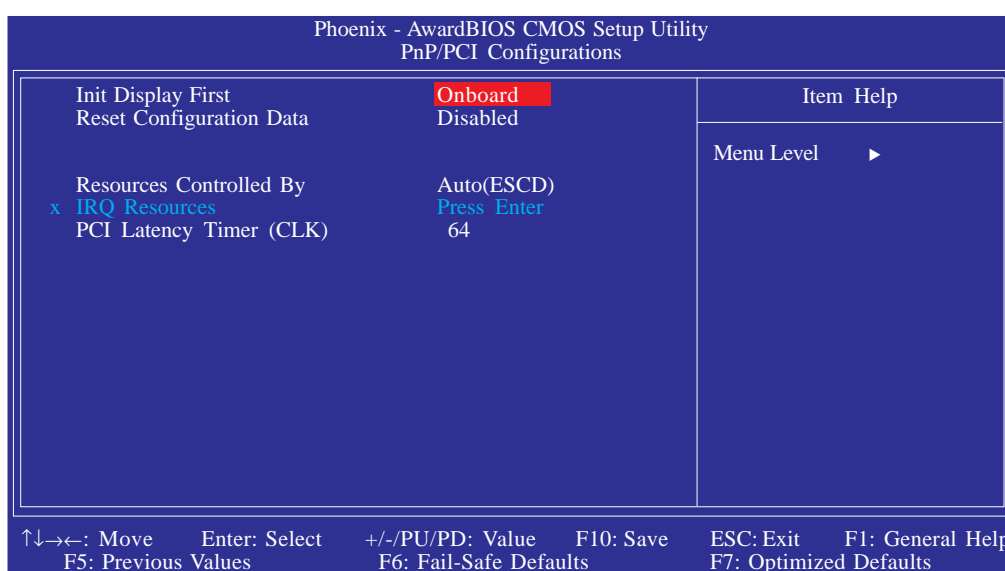
1-31 Select a date you would like the system to power-on. The system will power-on on the set date, and time set in the "Time (hh:mm:ss) Alarm" field.

### Time (hh:mm:ss) Alarm

This is used to set the time you would like the system to power-on. If you want the system to power-on everyday as set in the "Date (of Month) Alarm" field, the time set in this field must be later than the time of the RTC set in the Standard CMOS Features submenu.

## PnP/PCI Configurations

This section shows how to configure the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



The settings on the screen are for reference only. Your version may not be identical to this one.

### Init Display First

*Onboard* When the system boots, it will first initialize the onboard VGA.

*PCI Slot* When the system boots, it will first initialize PCI.

### Reset Configuration Data

*Enabled* The BIOS will reset the Extended System Configuration Data (ESCD) once automatically. It will then recreate a new set of configuration data.

*Disabled* The BIOS will not reset the configuration data.

### Resources Controlled By

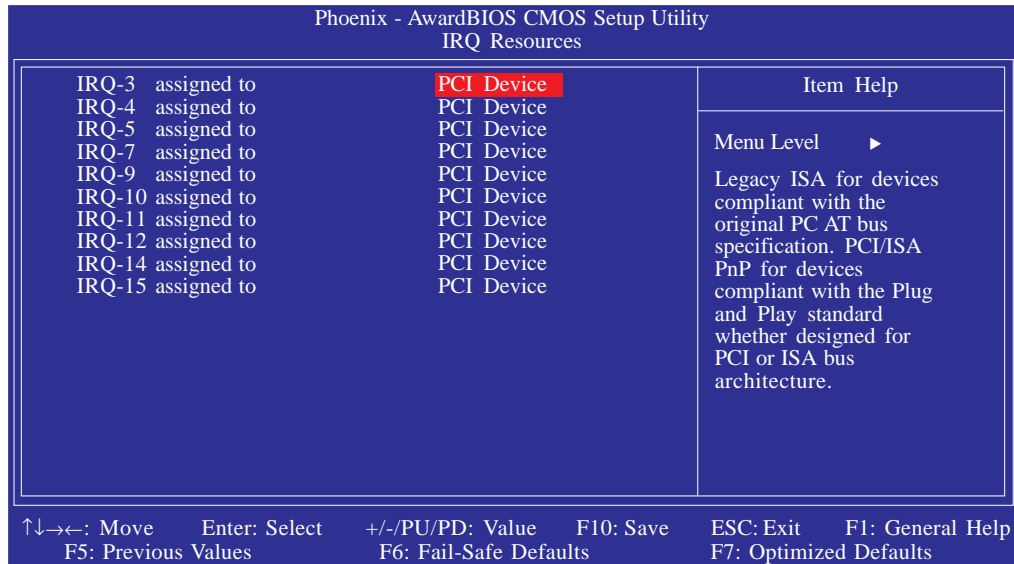
The Award Plug and Play BIOS has the capability to automatically configure all of the boot and Plug and Play compatible devices.

*Auto* The system will automatically detect the settings for you.

*Manual* Choose the specific IRQ in the "IRQ Resources" field respectively.

## IRQ Resources

Move the cursor to this field and press <Enter>. This field is used to set each system interrupt to either Reserved or PCI Device.



The settings on the screen are for reference only. Your version may not be identical to this one.

## PCI Latency Timer (CLK)

This feature is used to select the length of time each PCI device will control the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Since each access to the bus comes with an initial delay before any transaction can be made, low values for the PCI Latency Timer will reduce the effectiveness of the PCI bandwidth while higher values will improve it.



## PC Health Status

Phoenix - AwardBIOS CMOS Setup Utility		
PC Health Status		
Current System Temp.	36°C	Item Help
Current CPU Temperature	48°C	
Current System FAN Speed	0 RPM	
Current CPU FAN Speed	1548 RPM	Menu Level ▶
Vcore	1.23V	
V3SB	3.34V	
Vcc3	3.07V	
Vcc5	4.75V	
+12V	11.89V	
V5SB	4.72V	
VBAT	3V	

↑↓→←: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help  
F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

The settings on the screen are for reference only. Your version may not be identical to this one.

## Current System Temp, Current CPU Temperature, Current System Fan Speed and Current CPU Fan Speed

These fields will show the internal temperature of the system, current temperature of the CPU, and the current fan speed of the cooling fans in RPM (Revolutions Per Minute).

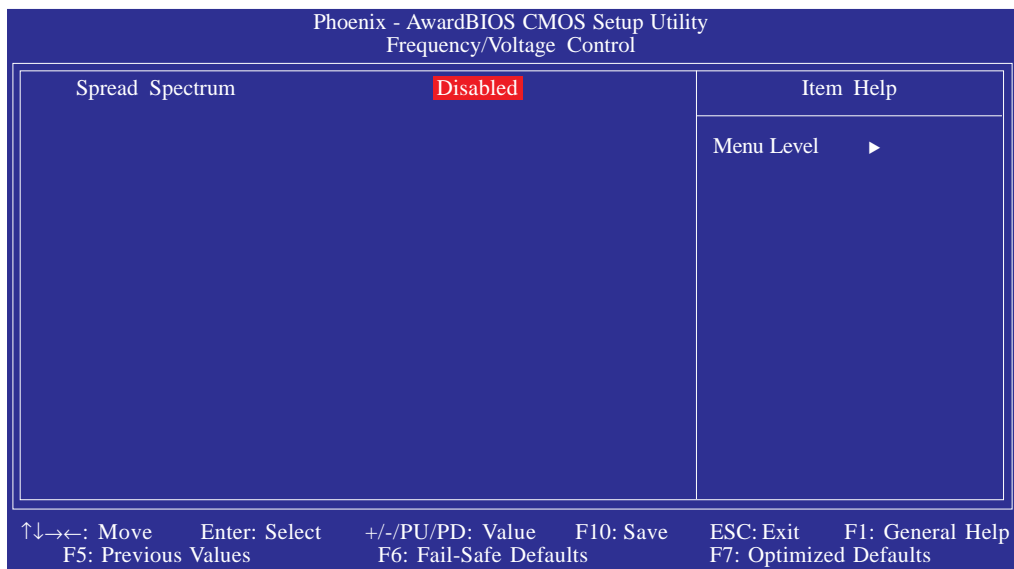
## Vcore to VBAT



### Note:

The onboard hardware monitor function is capable of detecting "system health" conditions but if you want a warning message to pop-up or a warning alarm to sound when an abnormal condition occurs, you must install the Hardware Monitor utility. This utility is included in the CD that came with the system board. Refer to the Hardware Monitor section in chapter 4 for more information.

## Frequency/Voltage Control



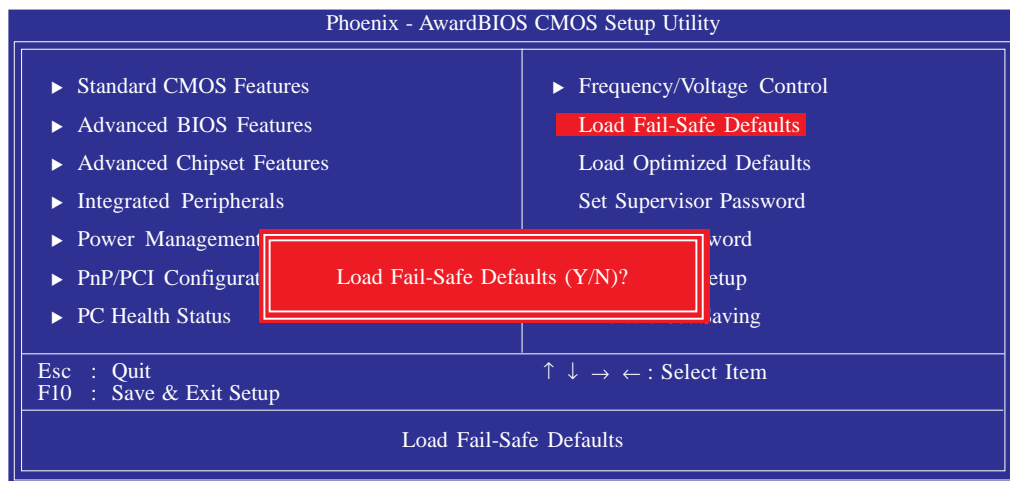
The settings on the screen are for reference only. Your version may not be identical to this one.

### Spread Spectrum

Leave this field in its default setting. Do not alter this setting unless advised by an engineer or technician.

## Load Fail-Safe Defaults

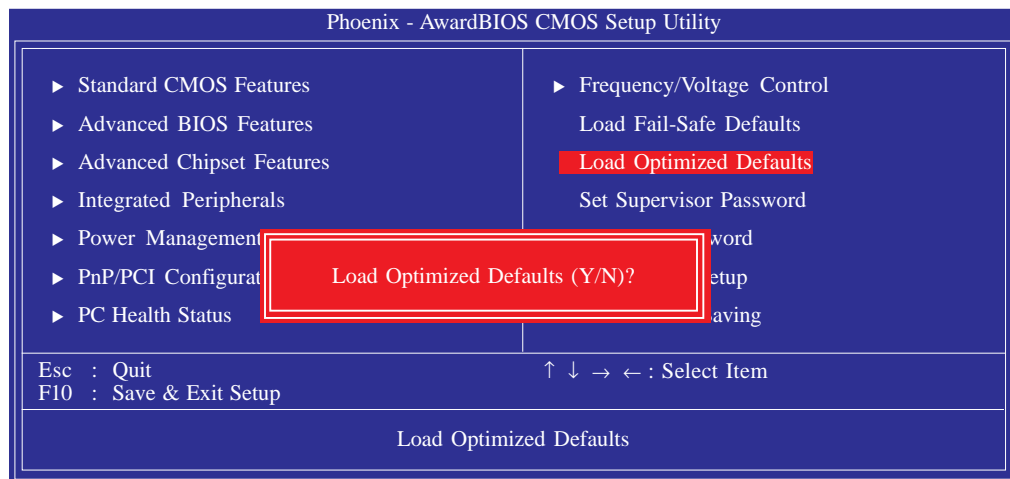
The “Load Fail-Safe Defaults” option loads the troubleshooting default values permanently stored in the ROM chips. These settings are not optimal and turn off all high performance features. You should use these values only if you have hardware problems. Highlight this option in the main menu and press <Enter>.



If you want to proceed, type <Y> and press <Enter>. The default settings will be loaded.

## Load Optimized Defaults

The “Load Optimized Defaults” option loads optimized settings from the BIOS ROM. Use the default values as standard values for your system. Highlight this option in the main menu and press <Enter>.

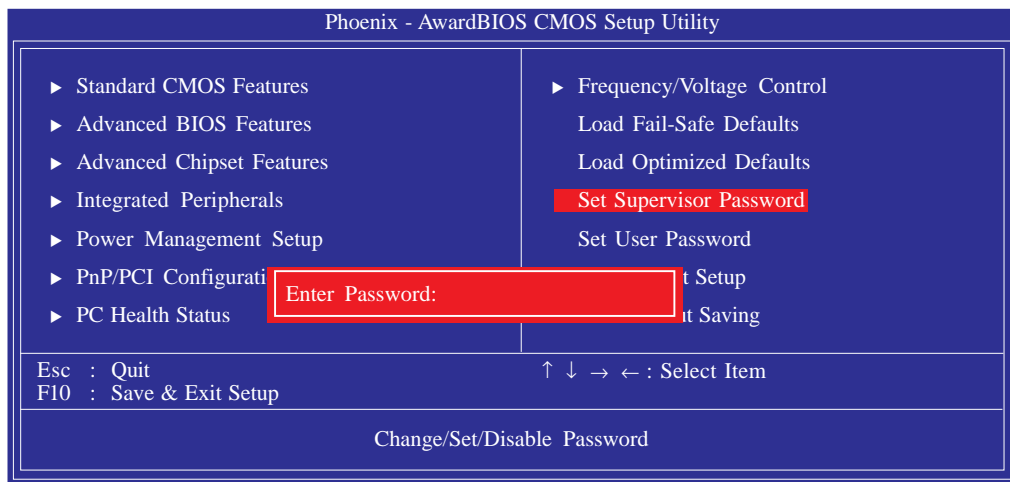


Type <Y> and press <Enter> to load the Setup default values.

## Set Supervisor Password

If you want to protect your system and setup from unauthorized entry, set a supervisor's password with the "System" option selected in the Advanced BIOS Features. If you want to protect access to setup only, but not your system, set a supervisor's password with the "Setup" option selected in the Advanced BIOS Features. You will not be prompted for a password when you cold boot the system.

Use the arrow keys to highlight "Set Supervisor Password" and press <Enter>.



Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

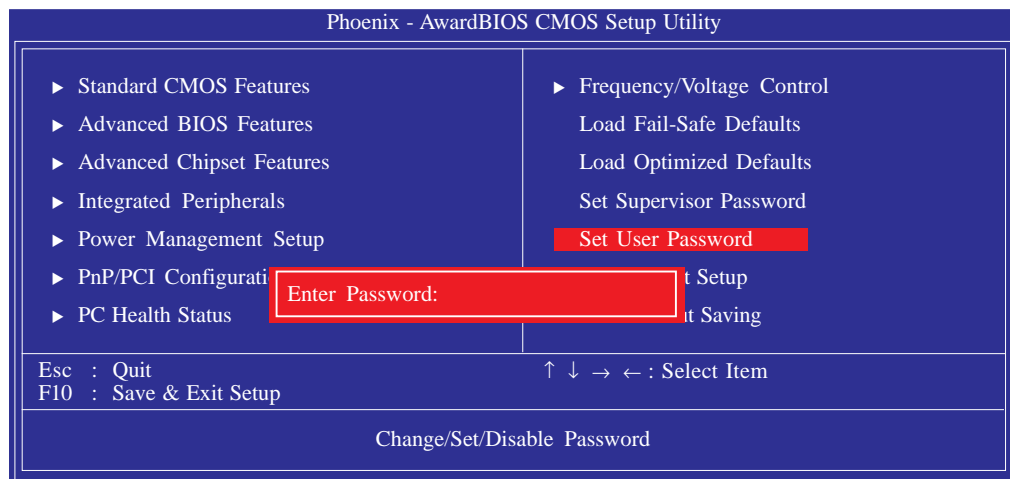
You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set Supervisor Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

## Set User Password

If you want another user to have access only to your system but not to setup, set a user's password with the "System" option selected in the Advanced BIOS Features. If you want a user to enter a password when trying to access setup, set a user's password with the "Setup" option selected in the Advanced BIOS Features.

Using user's password to enter Setup allows a user to access only "Set User Password" that appears in the main menu screen. Access to all other options is denied.

Use the arrow keys to highlight "Set User Password" and press <Enter>.



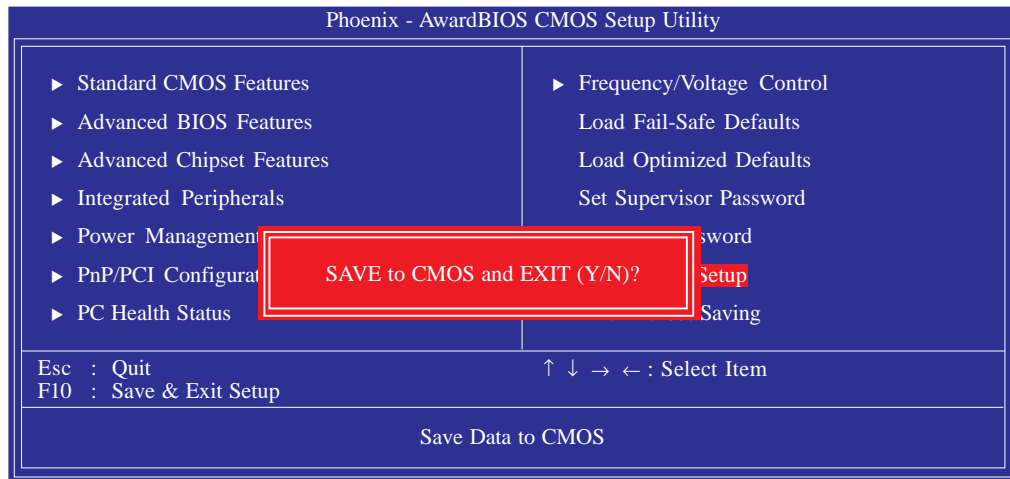
Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set User Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

## Save & Exit Setup

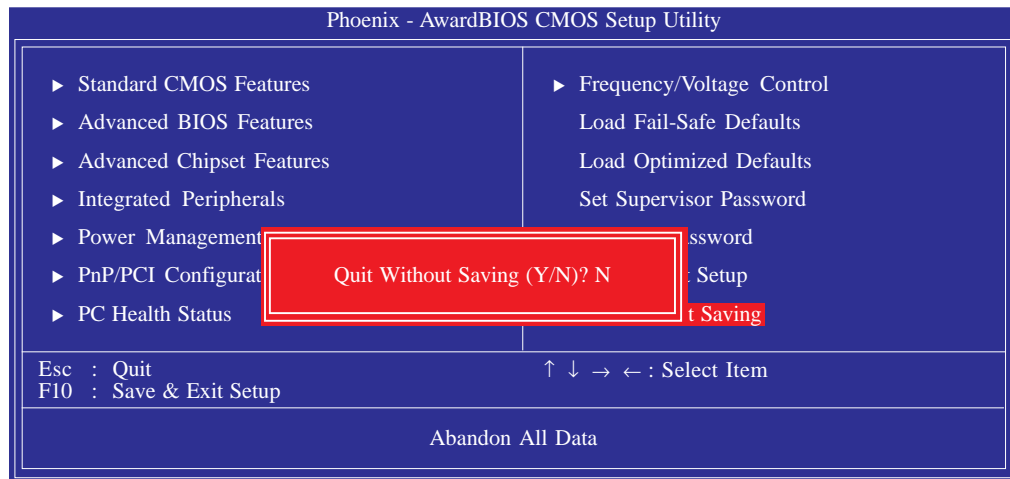
When all the changes have been made, highlight “Save & Exit Setup” and press <Enter>.



Type “Y” and press <Enter>. The modifications you have made will be written into the CMOS memory, and the system will reboot. You will once again see the initial diagnostics on the screen. If you wish to make additional changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or <Del> after memory testing is done.

## Exit Without Saving

When you do not want to save the changes you have made, highlight “Exit Without Saving” and press <Enter>.



Type “Y” and press <Enter>. The system will reboot and you will once again see the initial diagnostics on the screen. If you wish to make any changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or <Del> after memory testing is done.



## Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AWDFLASH.EXE. Please contact technical support or your sales representative for the files.

1. Save the new BIOS file along with the flash utility AWDFLASH.EXE to a floppy disk.
2. Reboot the system and enter the Award BIOS Setup Utility to set the first boot drive to "Floppy".
3. Save the setting and reboot the system.
4. After the system booted from the floppy disk, execute the flash utility by typing AWDFLASH.EXE. The following screen will appear:

<p>Award BIOS Flash Utility V.8.15B (C) Phoenix Technologies Ltd. All Rights Reserved.</p>
<p>(The current BIOS information will appear in this area.)</p> <p>File Name to Program : <input type="text"/></p>

5. Type the new BIOS file name onto the gray area that is next to "File Name to Program" then press <Enter>.

6. The following will appear:

Do You Want to Save BIOS (Y/N)

This question refers to the current existing BIOS in your system. We recommend that you save the current BIOS and its flash utility; just in case you need to reinstall the BIOS. To save the current BIOS, press <Y> then enter the file name of the current BIOS. Otherwise, press <N>.

7. The following will then appear:

Press "Y" to Program or "N" to Exit

8. Press <Y> to flash the new BIOS.

## Chapter 4 - Supported Software

---

### Drivers, Utilities and Software Applications

The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the CD into a CD-ROM drive. The autorun screen (Mainboard Utility CD) will appear. If after inserting the CD, "Autorun" did not automatically start (which is, the Mainboard Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".

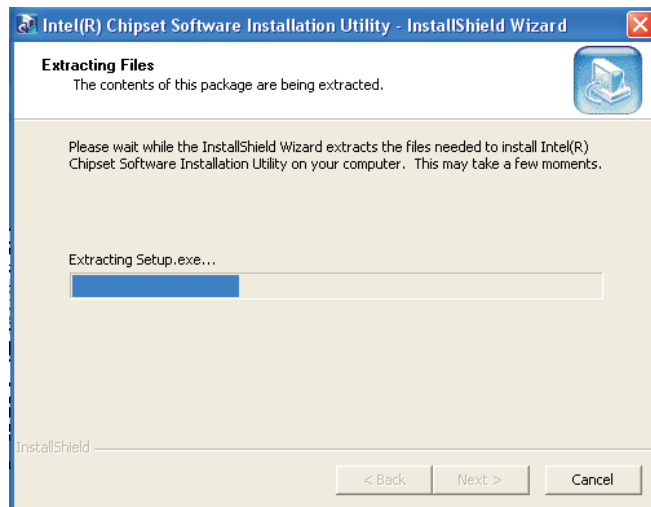


## Intel Chipset Software Installation Utility

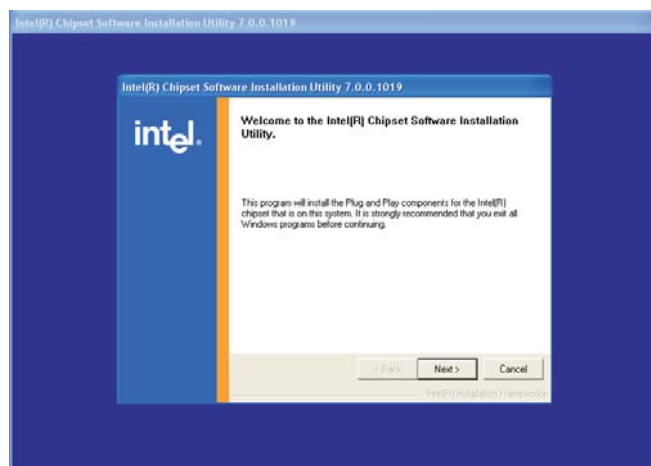
The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, click “Intel Chipset Software Installation Utility” on the main menu.

1. The installation wizard will extract the files needed to install the utility. After all files have been extracted, click Next.



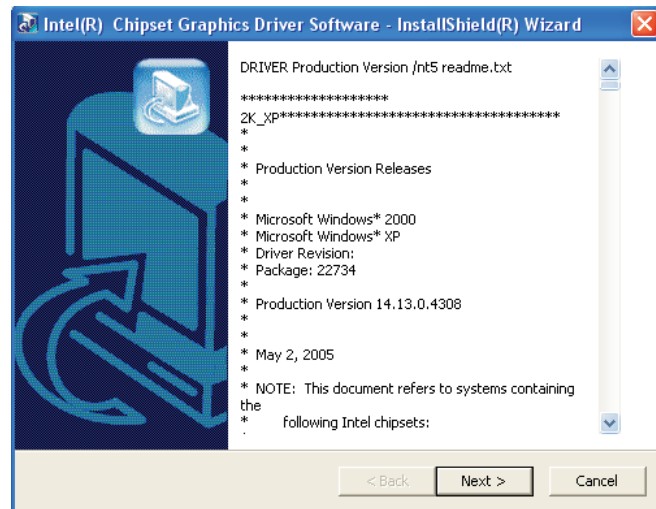
2. You are now ready to install the utility. Click Next.
3. Follow the prompts on the screen to complete installation.
4. Reboot the system for the utility to take effect.



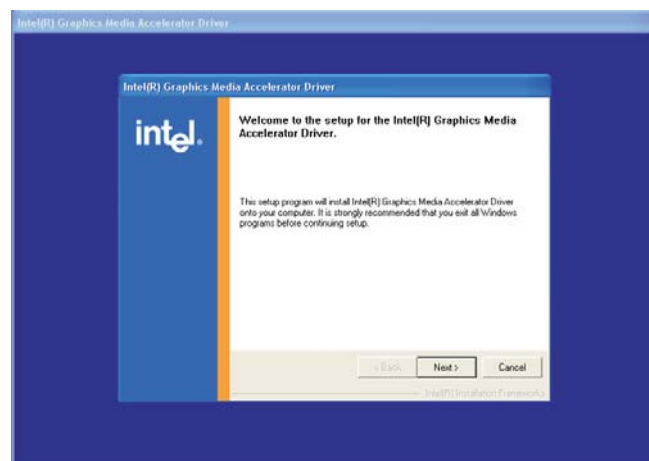
## Intel Graphics Drivers - 32bit

To install the driver, click “Intel Graphics Drivers” on the main menu.

1. Go through the readme document for more installation tips then click Next.



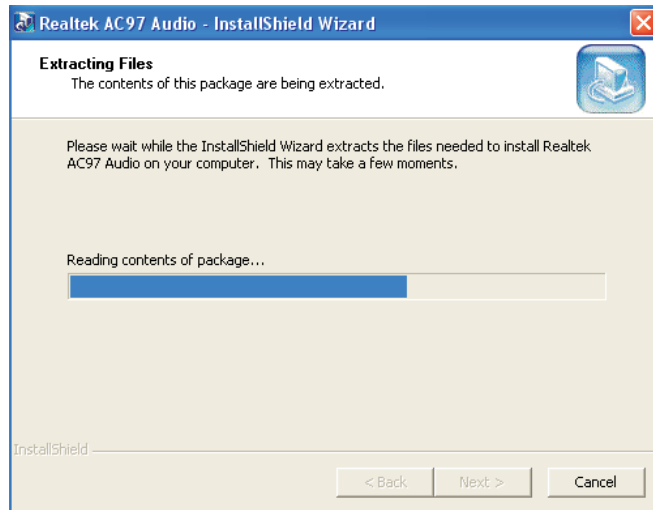
2. You are now ready to install the driver. Click Next.
3. Follow the prompts on the screen to complete installation.
4. Reboot the system for the driver to take effect.



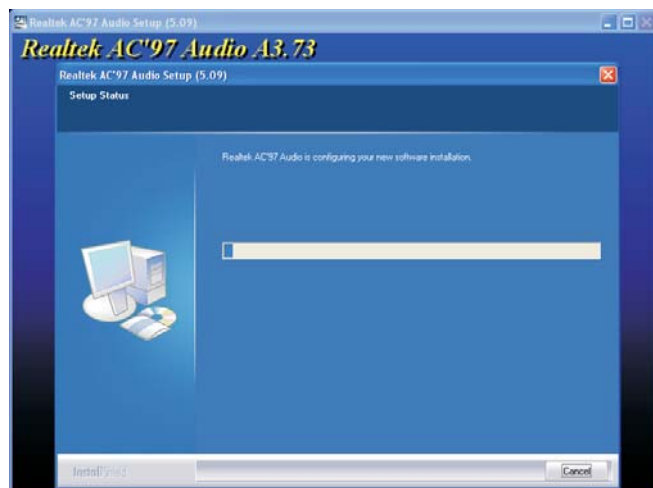
## Realtek Audio Drivers

To install the driver, click “Realtek Audio Drivers” on the main menu.

1. The installation wizard will extract the files needed to install AC97 audio. After all files have been extracted, click Next.

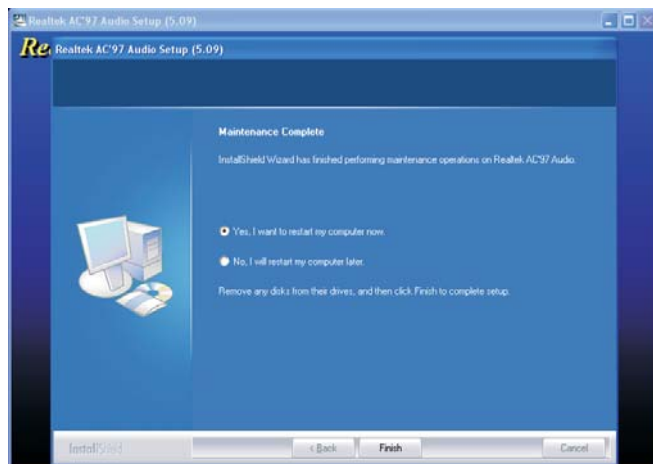


2. AC97 audio is installing and configuring the new software installation.



3. Click “Yes, I want to restart my computer now” then click Finish.

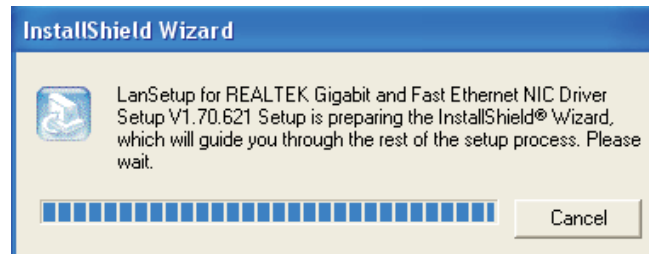
Restarting the system will allow the new software installation to take effect.



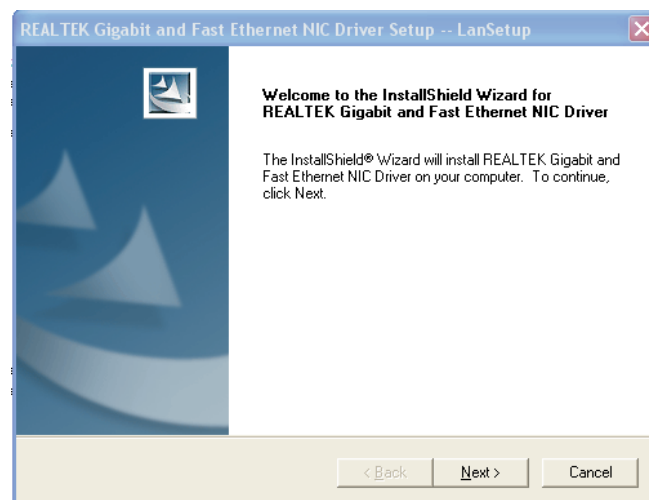
## Realtek LAN Drivers

To install the driver, click “Realtek LAN Drivers” on the main menu.

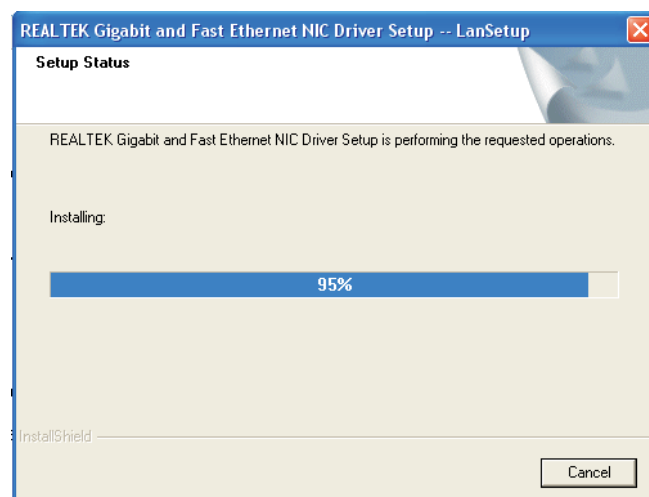
1. LanSetup is now preparing the installation wizard.



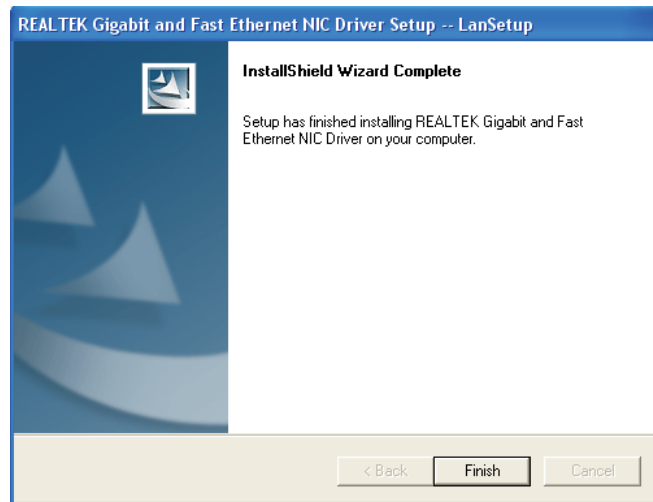
2. You are now ready to install the driver. Click Next.



3. LanSetup is installing the new driver.



4. Click Finish. Reboot the system for the driver to take effect.



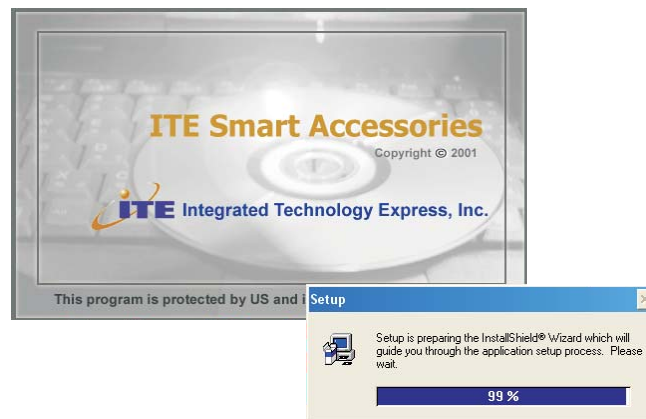


## ITE Hardware Monitor

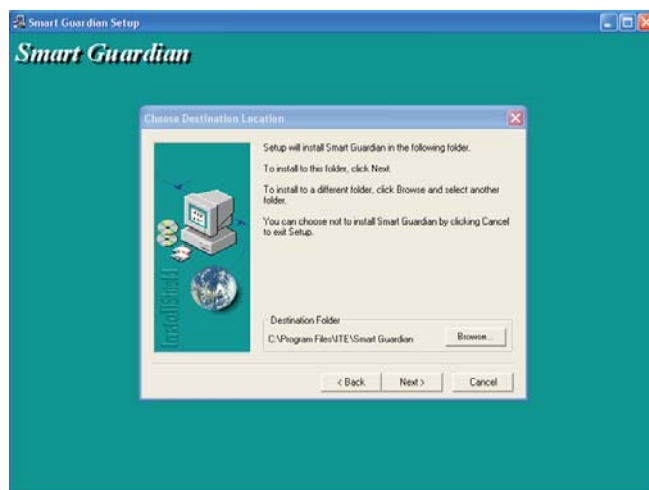
The system board comes with the ITE Hardware Monitor utility. This utility is capable of monitoring the system's temperature, fan speed, voltage, etc. and allows you to manually set a range (Highest and Lowest Limit) to the items being monitored. If the settings/values are over or under the set range, a warning message will pop-up. The utility can also be configured so that a beeping alarm will sound whenever an error occurs. We recommend that you use the "Default Setting" which is the ideal setting that would keep the system in good working condition.

To install, click "ITE Hardware Monitor" on the main menu.

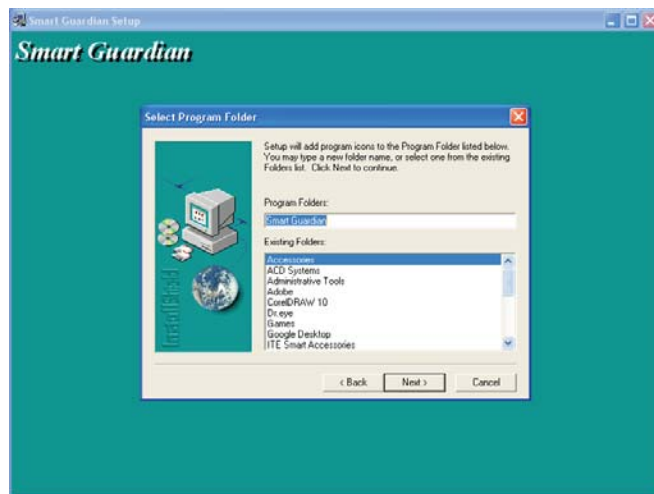
1. Setup is now preparing the installation wizard.



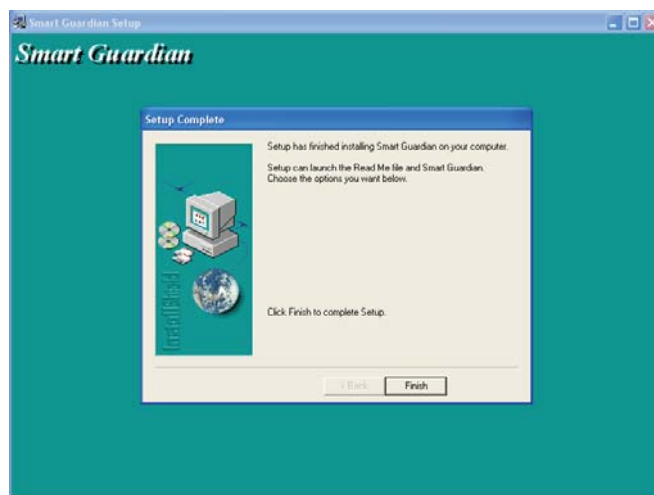
2. You are now ready to install Smart Guardian. Click Next to install or click Browse to select another folder.



2. Click Next to add the program icon to the Program Folder:



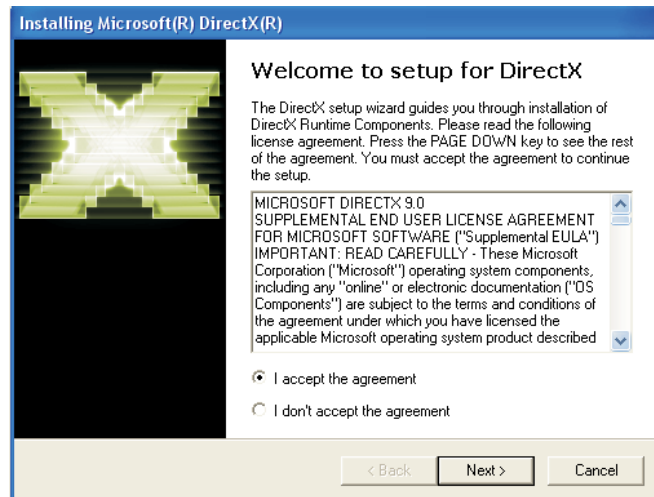
4. Click Finish. Reboot the system for the driver to take effect.



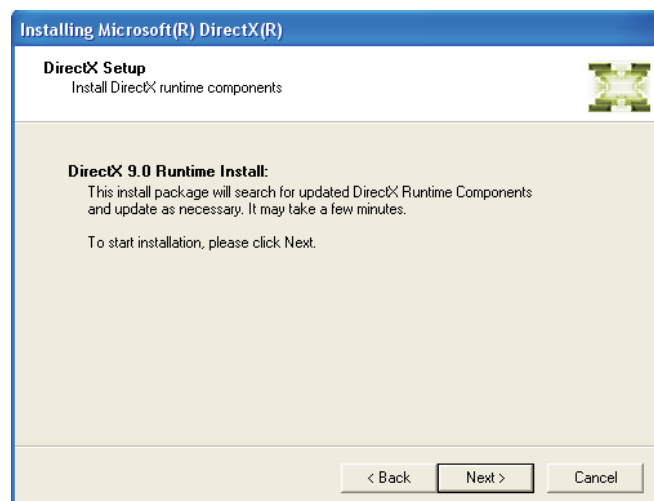
## Microsoft DirectX 9.0C Driver

To install, click “Microsoft DirectX 9.0” on the main menu.

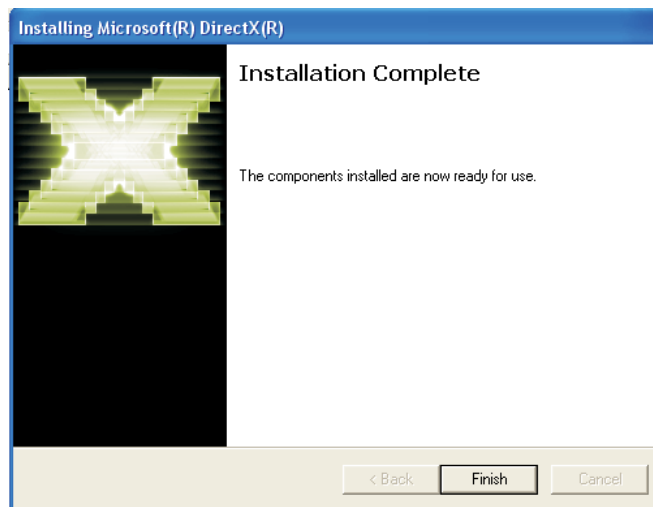
1. Click “I accept the agreement” then click Next.



2. You are now ready to install DirectX. Click Next.



3. Click Finish. Reboot the system for DirectX to take effect.



## Adobe Acrobat Reader 6.0

To install, click “Adobe Acrobat Reader 6.0” on the main menu.

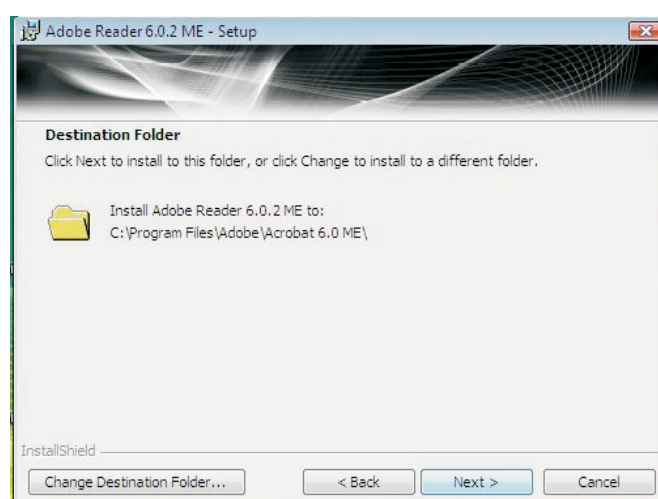
1. Click Next to continue.



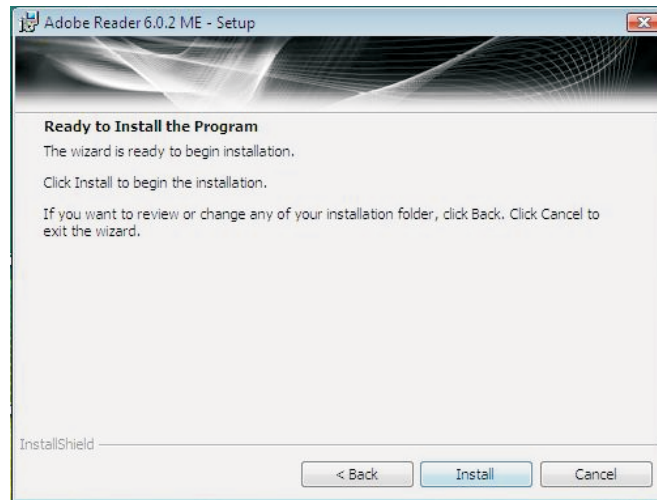
2. Setup is now ready to install. Click Next.



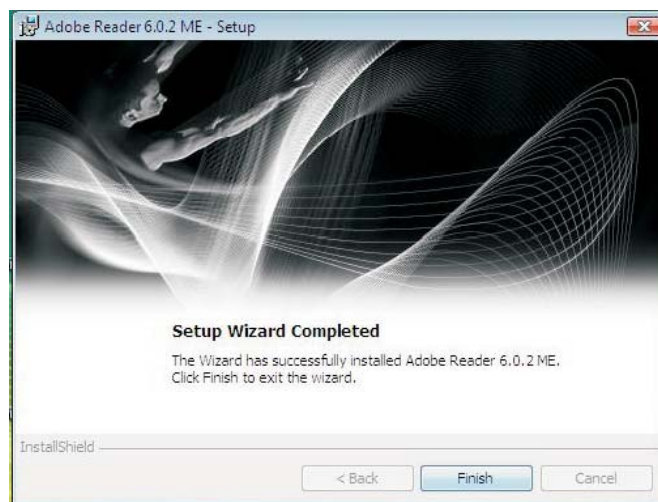
3. Click Next to install or click Change Destination Folder to select another folder.



4. Click Install to begin installation.



5. Click Finish to exit installation.



## Installation Notes

1. "Autorun" ONLY supports the Windows® 2000 and Windows® XP operating systems. If after inserting the CD, "Autorun" did not automatically start (which is, the Main Board Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".
2. The drivers for Windows® XP Professional x64 Edition are also included in the CD however "Autorun" is not supported for this operating system. Therefore you must manually install the drivers from the respective folders of each driver.
3. All steps or procedures to install software drivers are subject to change without notice as the softwares are occasionally updated. Please contact technical support or your sales representative for the latest version of the drivers or software applications.

## Appendix A - Enabling Hyper-Threading Technology

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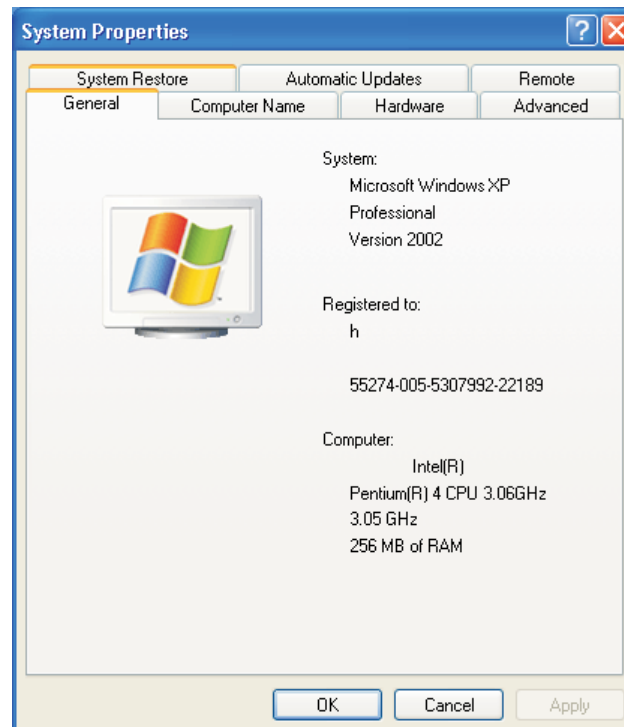
### Enabling Hyper-Threading Technology

To enable the functionality of the Hyper-Threading Technology, please follow the requirements and steps below. Basically, the following presumes that you have already installed an Intel® Pentium® 4 Processor with Hyper-Threading Technology.

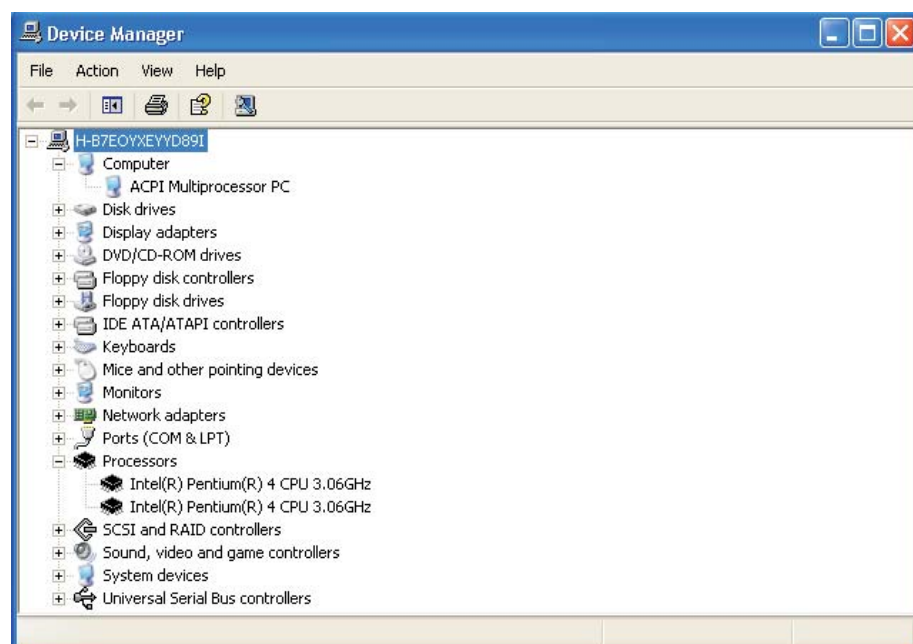
1. The system requires a minimum of 300 Watt ATX 12V power supply.
2. Aside from installing a CPU fan on the Intel® Pentium® 4 Processor with Hyper-Threading Technology, make sure to install cooling fans. The system requires adequate airflow throughout the chassis to prevent overheating the processor.
3. The “CPU Hyper-Threading” field in the Advanced BIOS Features submenu of the Award BIOS setup will appear. Make sure this field is set to Enabled.
4. Currently, only Windows® XP supports the Hyper-Threading Technology. If this OS has been previously installed, you must **REINSTALL** it.
5. After installing Windows® XP, please check the following to ensure that the operating system has been properly installed.
  - a. Click Start, point to Settings then click Control Panel.
  - b. Double-click the System icon. The System Properties dialog box will appear.



- c. Click the General tab. The processor shown under Computer should resemble the one shown below.

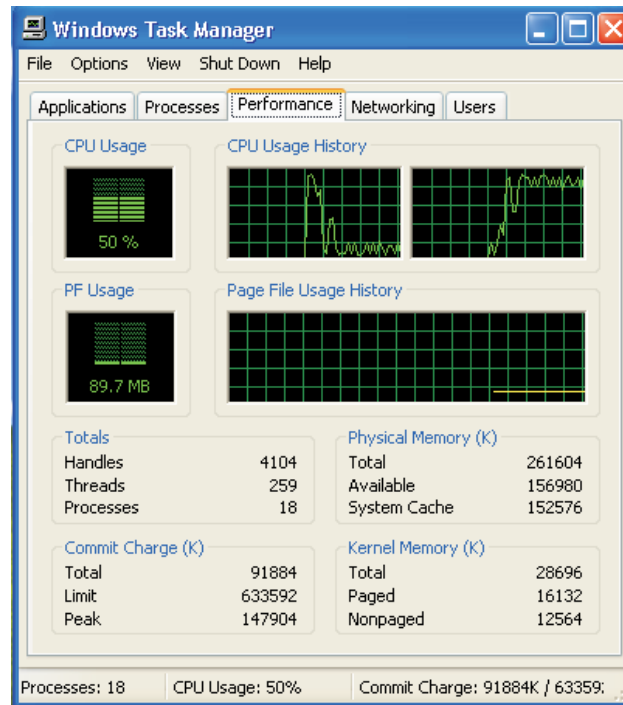


- d. Now click the Hardware tab then click Device Manager. The items shown under Computer and Processors should resemble the ones shown below.



## Enabling Hyper-Threading Technology .....

- e. Lastly, press the <Ctrl> <Alt> and <Del> keys simultaneously. The Windows Task Manager dialog box will appear. Click the Performance tab. The diagram under CPU Usage History should resemble the one shown below.



## Appendix B - System Error Message

---

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

### Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

#### CMOS BATTERY HAS FAILED

The CMOS battery is no longer functional. It should be replaced.



#### **Caution:**

*Danger of explosion if battery incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.*

#### CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

#### DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

#### FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

#### FLOPPY DISK(S) fail (40)

Floppy type mismatch.

**Hard Disk(s) fail (80)**

HDD reset failed.

**Hard Disk(s) fail (40)**

HDD controller diagnostics failed.

**Hard Disk(s) fail (20)**

HDD initialization error.

**Hard Disk(s) fail (10)**

Unable to recalibrate fixed disk.

**Hard Disk(s) fail (08)**

Sector Verify failed.

**Keyboard is locked out - Unlock the key**

The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

**Keyboard error or no keyboard present**

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

**Manufacturing POST loop**

System will repeat POST procedure infinitely while the keyboard controller is pull low. This is also used for the M/B burn in test at the factory.

**BIOS ROM checksum error - System halted**

The checksum of ROM address F0000H-FFFFFH is bad.

**Memory test fail**

The BIOS reports memory test fail if the memory has error(s).

## Appendix C - Troubleshooting

---

### Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.
2. All cables and power cords are tightly connected.
3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.
4. The monitor is turned on.
5. The display's brightness and contrast controls are adjusted properly.
6. All add-in boards in the expansion slots are seated securely.
7. Any add-in board you have installed is designed for your system and is set up correctly.

### Monitor/Display

**If the display screen remains dark after the system is turned on:**

1. Make sure that the monitor's power switch is on.
2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
4. Adjust the brightness of the display by turning the monitor's brightness control knob.

### The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
3. Make sure your video card's output frequencies are supported by this monitor.

### The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

## Power Supply

### When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

## Floppy Drive

### The computer cannot access the floppy drive.

1. The floppy diskette may not be formatted. Format the diskette and try again.
2. The diskette may be write-protected. Use a diskette that is not write-protected.
3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.
4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

## Hard Drive

### Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

### Excessively long formatting period.

If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

## Parallel Port

### The parallel printer doesn't respond when you try to print.

1. Make sure that your printer is turned on and that the printer is on-line.
2. Make sure your software is configured for the right type of printer attached.
3. Verify that the onboard LPT port's I/O address and IRQ settings are configured correctly.
4. Verify that the attached device works by attaching it to a parallel port that is working and configured correctly. If it works, the printer can be assumed to be in good condition. If the printer remains inoperative, replace the printer cable and try again.

## Serial Port

### The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.
2. Verify that the device is plugged into the correct serial port on the rear of the computer.

3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
4. Make sure the COM settings and I/O address are configured correctly.

## Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.
2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

## System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
2. Check the jumper settings to ensure that the jumpers are properly set.
3. Verify that all memory modules are seated securely into the memory sockets.
4. Make sure the memory modules are in the correct locations.
5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.



## Appendix D - Watchdog Sample Code

---

;Software programming example:

```
;-----  
;(1)Enter Superio Configuration mode  
;-----  
MOV    DX,2Eh  
MOV    AL,87h  
OUT    DX,AL  
MOV    AL,01h  
OUT    DX,AL  
MOV    AL,55h  
OUT    DX,AL  
MOV    AL,55h  
OUT    DX,AL  
;-----  
;(2) Configuration Logical Device 7,register CR72 & CR73  
;  (Watch Dog Timer enable & Time-Out Value Register)  
;-----  
MOV    DX,2Eh  
MOV    AL,07h    ;Ready to Program Logical Device  
OUT    DX,AL  
  
MOV    DX,2Fh  
MOV    AL,07h    ;Select Logical Device 7  
OUT    DX,AL  
  
MOV    DX,2Eh  
MOV    AL,72h    ;Select CR72  
OUT    DX,AL  
  
MOV    DX,2Fh  
IN     AL,DX  
OR     AL,40h    ;Set CR72[Bit:6]=1, WDT output through KRST  
                     enable  
OUT    DX,AL
```

```
MOV    DX,2Eh
MOV    AL,73h    ;Select CR73 (Watch Dog Timer Time-Out Value
                  Register)
OUT     DX,AL

MOV    DX,2Fh
MOV    AL,02h    ;Set CR73 value = 02h => Watch Dog Time = 2
                  (unit:Min)
OUT     DX,AL

;-----
;(3) Exit extended function mode
;-----
MOV    DX,2Eh
MOV    AL,02h
OUT     DX,AL

MOV    DX,2Fh
MOV    AL,02h
OUT     DX,AL
```